SERVICE MANUAL

TEAC Tascam Series
MODEL 80-8
8 CHANNEL
RECORDER/REPRODUCER

TEAC®

WHIRL-A SOUND
VINTAGE AUDIO REPAIR

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1. INTRODUCTION

The TEAC Tascam Series 80-8 Recorder/Reproducer is an 8 track 8 channel machine regardless of its small size and light weight, and is designed for recording studios and other similar applications.

The front panel control layout is designed with emphasis on simplicity without sacrifice in ease of operation for a multi-track recorder.

The record/reproduce amplifiers can be adjusted from the front and a plug-in type PC card is provided for each channel.

Tape travel is controlled by a full IC logic control system housed in the control unit above the record/reproduce amplifiers.

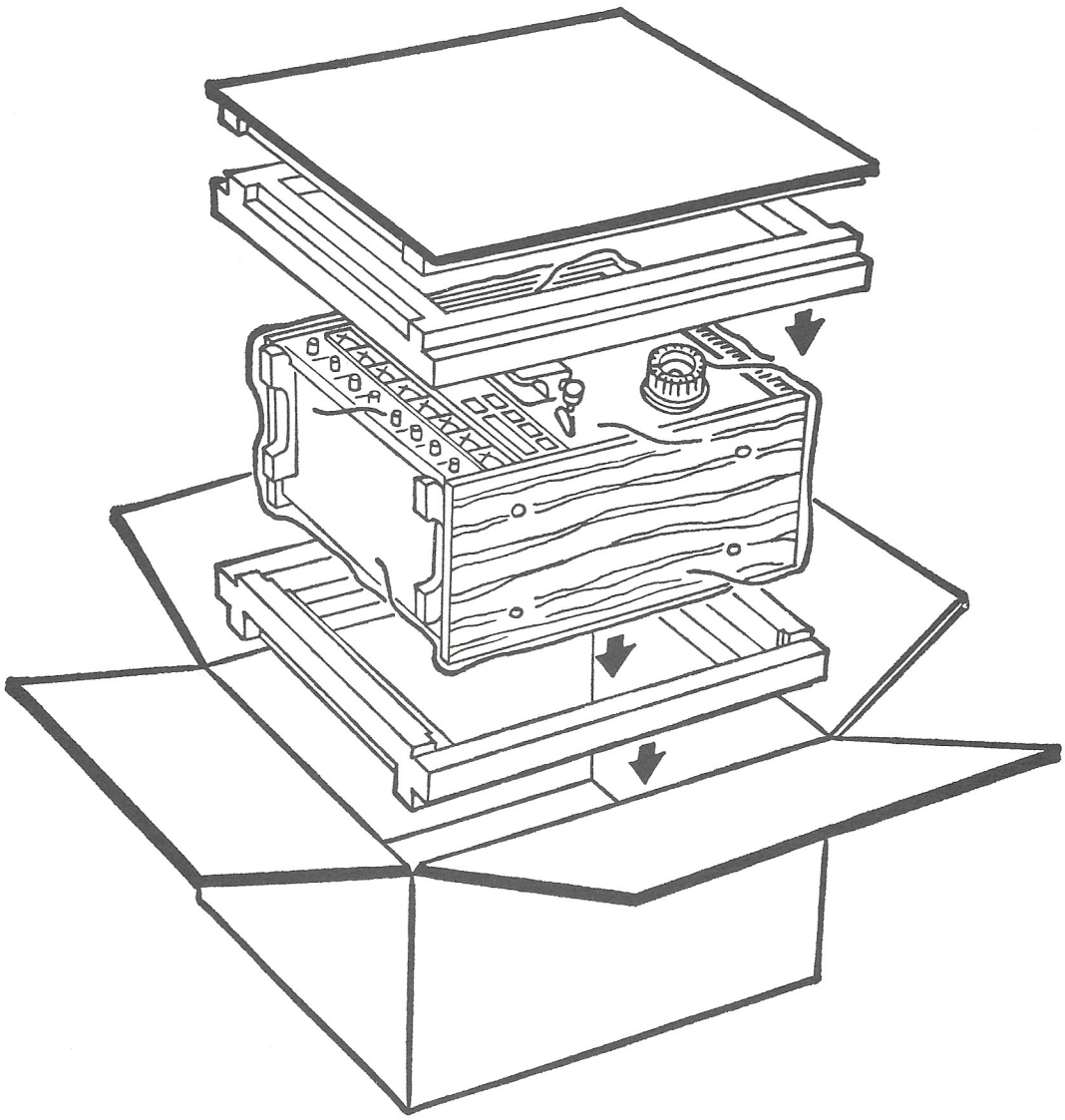
The Series 80-8 can also be mounted on a standard 19" rack by utilizing the TEAC RM-88 Rack Mounting Adaptor.

The TEAC DX-8 dbx Unit is also available which can be installed into the Series 80-8 to make one complete unit. Necessary connecting cables are included.

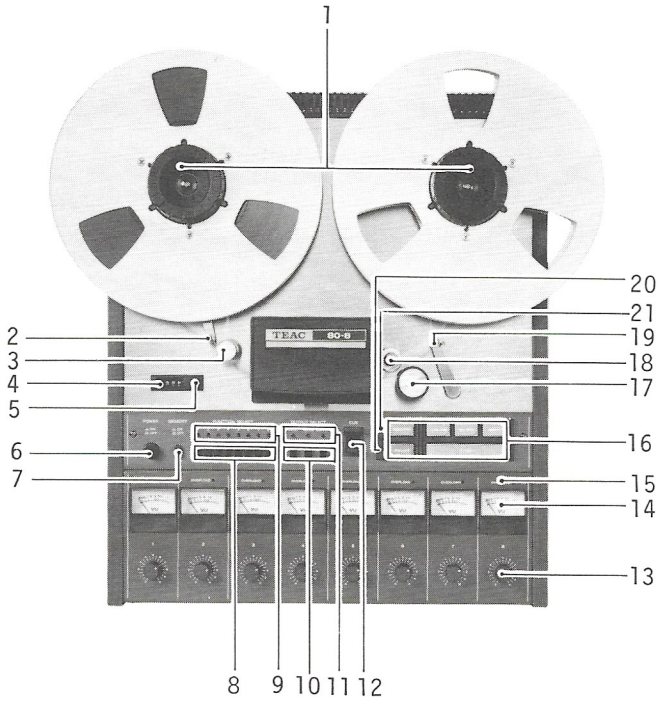
2. SPECIFICATIONS

TAPE WIDTH	1/2 inch
FORMAT	8-track, 8-channel
REEL SIZE	10-1/2" maximum, NAB hub only
TAPE SPEED	15 ips
LINE INPUT	-10 dB (0.3V) Impedance: greater than 20K ohms, unbalanced
LINE OUTPUT	-10 dB (0.3V) Load impedance: greater than 10K ohms, unbalanced
RECORD LEVEL CALIBRATION	0 VU referenced to 3 dB above 185nWb/m of tape flux, adjustable
SPEED ACCURACY	±0.5% deviation from 15 ips
WOW AND FLUTTER	0.04% RMS (NAB), weighted ±0.06% peak (ANSI), weighted Measured with flutter test tape
STARTING TIME	Less than 0.5 second
FAST WIND TIME	120 second for 2400 ft. of tape
OVERALL FREQUENCY RESPONSE, SYNC	40 Hz ∿ 18 KHz, ±3 dB
SIGNAL TO NOISE RATIO	65 dB weighted, 60 dB unweighted (22.4 Hz ∿ 22.4 KHz), referenced to 3% T.H.D. level (10 dB above 0 VU) at 400 Hz
DISTORTION	1% at 400 Hz, 0 VU
T.H.D. Overall	3% at 10 dB above 0 VU
CROSSTALK	Greater than 45 dB at 400 Hz
ERASURE	Greater than 65 dB at 1 KHz, +10 VU reference
POWER REQUIREMENTS	117 V, 60 Hz, 200 W
DIMENSIONS Overall	17-1/2" (W) X 21" (H) X 12" (D)
WEIGHT	77 lbs.

3. OPENING THE PACKAGE



4. FUNCTION OF THE CONTROLS



1. NAB hub adaptors

   These are permanently mounted on the reel turntables.
   In securing the 10-1/2" reel on the turntable, the three nicks in the reel center hole is matched with the three protrusions in the hub adaptor, the reel snugly pressed against the turntable face and the top knob of the hub adaptor rotated clockwise to firmly seat the reel.

2. Tape tension arm

3. Impedance roller

4. Index counter

   By switching ON the MEMORY button located on the control panel just below the counter, the tape will automatically stop from the rewind mode when all digits of the counter reach "zero."

5. Index counter reset button

   All digits of the tape counter will be reset to "zero" when the button on the right side of the counter is depressed.

6. Power switch

Controls AC power to the tape transport and the electronics assembly. Press to energize and power ON will be indicated by illumination of the VU meter lamps and an OUTPUT SELECT lamp whose button has been depressed. Also, the PAUSE lamp will blink for 10 seconds after switch ON, indicating that all deck controls are inoperable until they are extinguished.

7. Memory stop

Tape will stop from rewind when the counter digits reach all "zero" by depressing (switch ON) this button.

8. Function select buttons and,
9. LED indicators

a) During the STOP mode, when any of the FUNCTION SELECT switch is depressed, the LED for the depressed channel will blink to indicate that this channel is in "record standby." If the PLAY and RECORD buttons are depressed, the machine will immediately go into the record mode.

When it goes to the record mode, the FUNCTION SELECT LED which was blinking will change to a continuous light to indicate that this channel is recording.

b) With all channels of FUNCTION SELECT set to "OUT" and the PLAY and RECORD buttons are depressed at the same time, the RECORD lamp will start blinking. Under this condition, when any one or several FUNCTION SELECT buttons are depressed, those channels only will go into the RECORD mode (punch in) and return to "record standby" when these buttons are "OUT," and the RECORD lamp will start blinking again.

10. OUTPUT SELECT buttons and,
11. LED indicators

a) When the INPUT button is depressed, the source monitor signal will be output to LINE output for all channels.

b) When any one of the FUNCTION SELECT is "IN," by depressing the NORM button this "IN" channel source monitor only will be output to LINE output, and the tape signal reproduced by the record head will be output to the remaining LINE output jacks.

c) Tape signal picked up by the monitor head will be output to LINE out when the MONIT button is depressed.

12. CUE lever

For fast search, manually apply a slight amount of pressure upwards. Do not use the latch position for fast search cueing - it is intended for pause or stop mode cueing only.

13. Input level control

    For adjusting the source input level.

14. VU type averaging meters

    For visual reference of input/output signal levels.

15. LED peak overload indicators

    Complements VU meter by monitoring transient peaks. The trigger is factory calibrated at +10 VU, adjustable.

16. Transport controls

    Includes 6 micro switch buttons which provide complete control over all modes of tape transport motion. Remote control does not disengage the front panel controls.

17. Pinch roller

    Applies proper pressure for the tape to be driven by the capstan. Engaged only in PLAY and RECORD modes.

18. Capstan

    Drives the tape at a constant speed in PLAY and RECORD modes. Not engaged with the Pinch Roller during Fast Forward or Rewind, but rotation continues until electrical power is turned off.

19. Shut-off arm

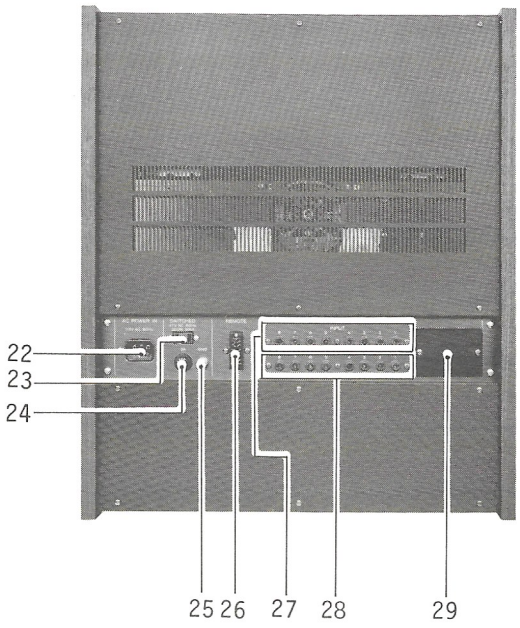
    Removes electrical power from the transport section when the tape ends.

20. PAUSE lamp

    This will blink for the first 10 seconds or so after POWER switch on, and all controls will be inoperable until the lamp goes out. It will, of course, light up when in PAUSE.

21. RECORD lamp

    Will blink when in "record standby;" remain lit when in the RECORD mode.



22. AC power cord

    Male socket. Connect power cord here.

23. AC switched

    AC power supplied when the 80-8 is ON. Use no more than 300W.

24. Fuse holder

    Contains 3 amp fuse for overload protection.

25. GND connection

    For connecting a grounding wire between components, or to earth ground as necessary.

26. Remote control socket

    For optional RC-170 Remote Control Unit. Needs no dummy plug when not in use.

27. Input jacks

    Line inputs for recording are connected to these eight pin cord jacks.

28. Output jacks

    Line outputs.

29. dbx interface section

    Removal panel for direct integral dbx interface.
    NOTE: For use with the DX-8 unit only.

5. MAINTENANCE

5.1 ROUTINE MAINTENANCE

Troubles and breakdown in the recorder can be prevented by scheduled check and maintenance. Periodically follow the check items below:

a) Cleaning the heads and tape guides

All heads and metal parts in the tape path must be cleaned after each 6 hours of operation or before starting a new session of recording.
The TEAC TZ-261A Cleaning Fluid is recommended.

b) Cleaning the pinch roller

Clean this at least once after each full day of use.
The TEAC TZ-261B Cleaning Fluid is recommended.

c) Cleaning the capstan

Clean this at the same time the head is cleaned.
The TEAC TZ-261A Cleaning Fluid is recommended.

d) Demagnetizing of heads and tape guides

All heads and tape guides should be demagnetized every morning or before starting a new session of recording. The TEAC E-1 Head Demagnetizer is recommended.

1) After cleaning, turn machine OFF!!!
2) Have all tapes at least 5 or 6 feet away when demagnetizing because the demagnetizer's magnetic field will erase them.
3) Slowly move the tip of the demagnetizer up and down in front of each head and slowly move it away (This is suggested because if you were to pull away quickly, remagnetizing of the head is possible). Like a turtle, demagnetize the second head and repeat the process, etc.

   After you repeat this process for all heads, move the demagnetizer an arms-length away, turn it off, and unplug it.

e) Testing the brakes

See Item 5.2.2, b) Brake torque, page 12.

f) Testing the pinch roller pressure

See Item 5.2.2, a) Pinch roller pressure, page 11.

g) Testing the amplifier

Thread a blank tape on the Model 80-8 and record a 1KHz, OVU signal.

While the machine is in the record mode, set the OUTPUT SELECT to MONITOR and adjust the INPUT level knob for a OVU reading. On repeating the same process on each channel, the INPUT knobs should all be indicating "7" on the scale.

Rewind the above recording to the beginning, set the OUTPUT SELECT to NORM, and put the machine in the PLAY mode. The VU meters should all read OVU.

Record a 20Hz through 20KHz signal and check the overall frequency response with the VU meter to see that it is within 2dB.

Disconnect any equipment plugged into the INPUT, record a length of no signal tape, and reproduce it to check the S/N ratio.

If it is below spec, refer to Item 5.2.4, h), page 22.

5.2 TESTING AND ADJUSTMENT

5.2.1 Test equipment required

Spring scale	0 ∿ 8 lbs (0 ∿ 4 kg) 0 ∿ 10 ozs (0 ∿ 300 g)
Flutter meter	Meguro Denpa Sokki Co., Model MK-668B (Japan), or - Mincom Division, 3M Co., Model 8155 (U.S.A.)
Audio oscillator	Hewlett Packard, Model 204C or equivalent
Frequency counter	Range: 0 ∿ 1MHz; sensitivity: 0.1Vrms; imp.: >1MΩ, <25pF
Band-pass filter	TEAC M-206A or a frequency analyzer
AC voltmeter	Range: -80dB ∿ +40dB; imp.: >1MΩ, <25pF (example: HP400GL)
Oscilloscope	General purpose
Test tapes	TEAC YTT-1144 (for reproduce alignment): Tape speed: 15 ips; reference fluxivity: 250nWb/m; equalization: IEC; time constant: ∞ & 35msec. or - MRL31J-129 (Magnetic Reference Lab.): All specs are identical with YTT-1144 except for the reference fluxivity which is 200nWb/m and thus its reproduce output level will be 2dB lower. For wow and flutter measurement: Standard Tape Lab., #62.
Blank tape	Ampex 456 or Maxell UD-50 is recommended.

5.2.2 Transport check and adjustment

a) Pinch roller pressure

Pinch roller pressure is supplied by the Pinch Roller Pressure Spring only and it is most important that the solenoid plunger be fully bottomed before taking pressure measurement.

1) Block the automatic shut-off arm in the ON position.
2) Attach a suitable spring scale to the pinch roller shaft with a short loop of twine.
3) Put the deck in the PLAY mode, and positioning the scale as illustrated, slowly draw it in direction opposite the capstan until the pinch roller stops rotating.
4) The spring scale should indicate 7 lbs., ±10%.
5) If the reading is off specification, loosen the 3 screws (Refer to Fig.A) and reposition the plunger solenoid. As the pressure will greatly change with only a slight shift in position, reposition the solenoid in small increments.

   The pressure will increase by moving the solenoid in the direction away from the capstan motor.

   After obtaining optimum pressure, securely tighten the 3 screws and make a final re-check of the pressure.

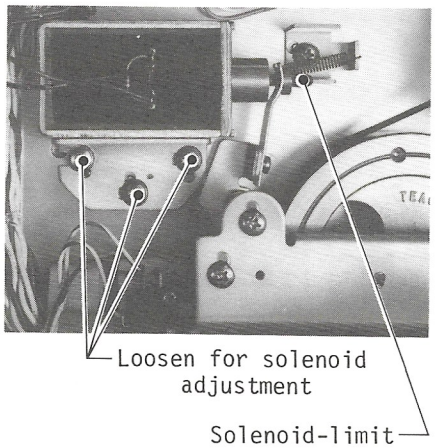


Fig. A

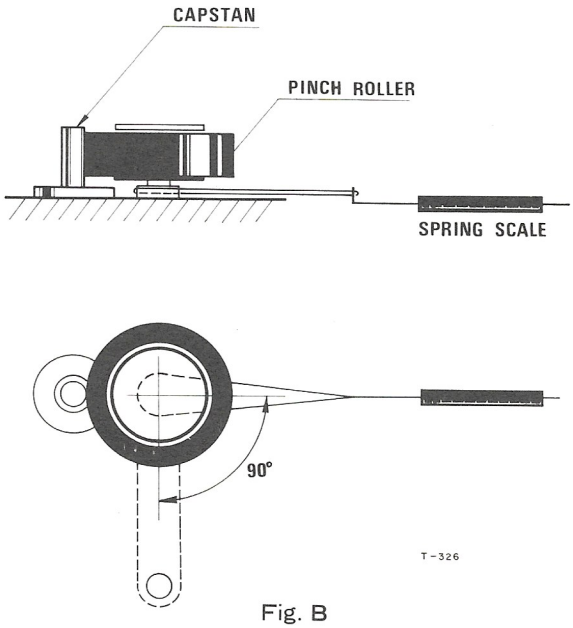


Fig. B

6) Adjust position of the solenoid-limit so that the gap between capstan shaft and pinch roller is approximately 7mm when solenoid is not actuated. Limit is adjusted by loosening the mounting screw (A), then sliding limit until proper gap is obtained.

b) Brake torque

Brake torque is applied mechanically. Pressure is set by the variable spring force. While making these measurements and adjustments, be careful not to bend the brake bands. As brake torque will change with cleaning, brake drums and brake shoes should be cleaned only when absolutely necessary. If cleaning is required, use TEAC cleaner TZ-261B. After cleaning, operate the machine for a month of normal operation before performing the procedures below.

Brake adjustments are made with NO power to the equipment.

1) Place an empty 2" hub reel on the left reel table, and fasten one end of a 30" length of string to the reel anchor.
2) Wind several turns of string CCW around the hub and attach a suitable spring scale to the free end of the string.
3) Take a reading only when the reel is in steady motion since the force required to overcome static friction will produce a false, excessively high initial reading.
4) The reading should be 33.5 ∿ 36.5 in-oz (2400 ∿ 2600 g-cm).
5) If adjustment is required, loosen the 2 screws shown and position the brake for optimum torque.
6) The adjustment of the right brake is the same, with the exception that rotations are clockwise (wind string CLOCKWISE around reel hub). The torque should be 36.5 ∿ 39.5 in-oz (2650 ∿ 2850 g-cm).

NOTE: The reason for the stronger brake torque than the left reel is to prevent tape slack at rewind stop.

Fig. C

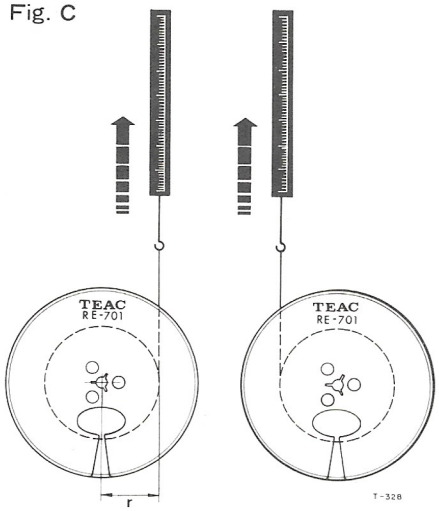
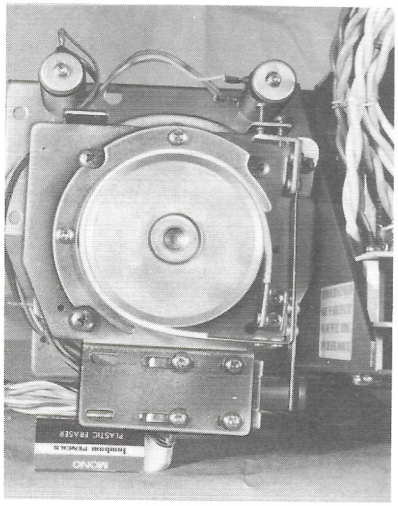


Fig. D



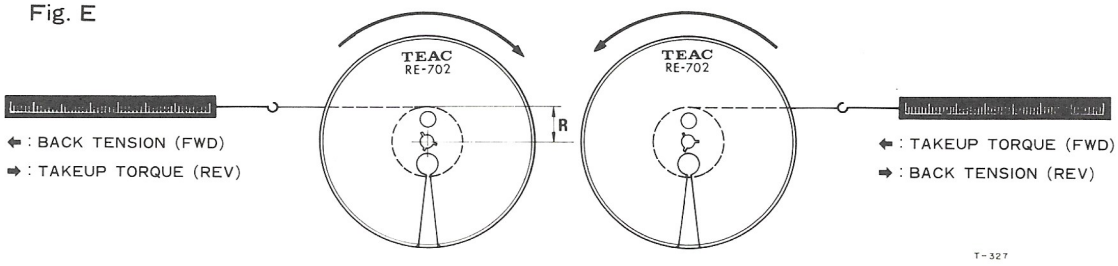
Formula for torque calculation:

T (in-oz/g-cm) = R x W Whereas - R = Radius of hub (in/cm)
W = (oz/gm)

c) Tape tension adjustment procedures

Tape tension is determined indirectly by measuring the torque supplied by the supply and takeup motors.

Fig. E



* Back tension adjustment procedures *

1) Block the shut-off arm in the ON position.
2) Place an empty NAB reel on the left reel table.
3) Manually rotate the reel and wind several turns of twine around the hub. Attach spring scale to other end of the twine.
4) Place deck in the PLAY mode.
5) Pull the scale away from the reel against the motor torque with a smooth, steady motion.
6) Read the scale while it is in steady motion and multiply this value by the hub radius to obtain the torque.
7) Be sure the twine is not rubbing against the reel flange when taking measurements.
8) The specified torque is 12 in-oz (850 g-cm), ±20%.
9) If adjustment is required, adjust tap of power resistor R204, as required. Refer to "Tape tension resistors," page 14 for details.

* Takeup tension adjustment procedures *

1) Place an empty NAB reel, with a spring scale attached to the hub by a length of twine, on the right reel table.
2) Place deck in the PLAY mode.
3) Allow the reel to slowly wind-in the scale.
4) Follow the spring scale travel with enough force to allow a steady reading and multiply this value by the reel hub radius to calculate the torque.
5) The specified torque is 17 in-oz (1200 g-cm), ±20%.
6) If adjustment is required, adjust tap of power resistor R203, as required. Refer to "Tape tension resistors," page 14 for details.

* Fast wind back tension adjustment procedures *

1) Block the shut-off arm in the ON position.
2) Place an empty NAB reel on the left reel table.

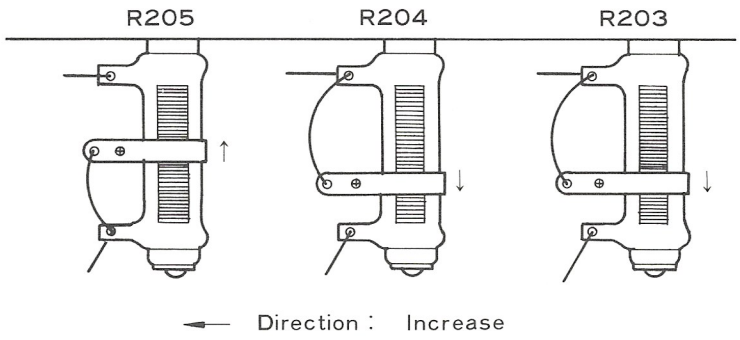
3) Attach one end of a length of twine to the hub, and wind several turns of it in direction of reel motor rotation when activated.
4) Attach a spring scale to other end of the twine.
5) Pull the scale to take up slack in the twine, and then place deck in the fast forward mode.
6) Hold the scale stationary (so that it is not pulled in) and take the reading when scale balances with tension of pull.
7) Torque is calculated by multiplying the reading with the hub radius.
8) Specified torque is between 0.7 and 1.0 in-oz (50 ∿ 70 g-cm).
9) If adjustment is required, adjust tap of power resistor R205, as required. Refer to "Tape tension resistors," below, for details.

This one-adjustment procedure completes back tension adjustments for both the rewind and fast forward modes.

d) Tape tension resistors

Tape tension is adjusted by sliding taps on the wirewound power resistors located above the supply reel motors, looking at the transport from the rear (See Fig. H, page 17).

Fig. F



Resistor	Adjustment for -
R203	Takeup reel tension in PLAY mode.
R204	Supply reel back tension in PLAY mode.
R205	Back tension in fast winding mode.

e) Reel height

Reel height adjustment is required only if a motor has been replaced or if tape rubs excessively against the reel flanges.

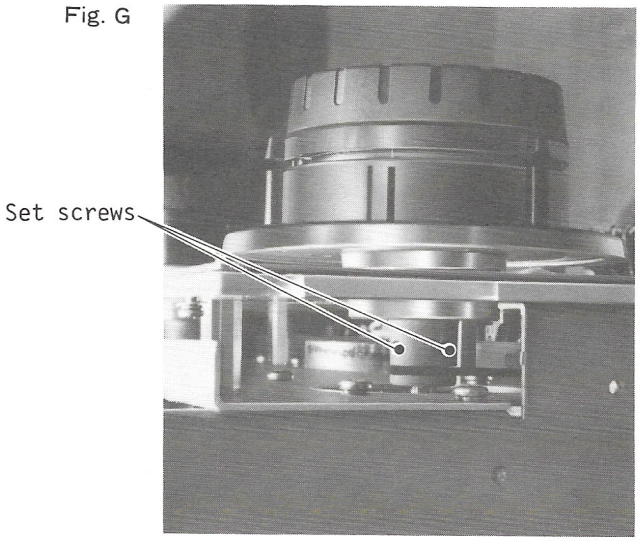
Adjustment is accomplished by loosening the reel set screws and moving the reel table on the motor shaft as shown in Fig.G.

Remove the wooden side board on the left or right of the deck for access to the Set Screw in the reel motor shaft.

Reel table should be adjusted using standard NAB 10" reels.

With a tape loaded on the machine, position the reel table height for smooth tape travel. Be sure to tighten the set screws after adjustment is made.

Fig. G



f) Wow and flutter

Wow and flutter measurements should be undertaken only after studying the following items and determining which method and standard will be employed.

A) Determine whether the Reproduce Method, or the Record/Reproduce Method, is to be employed for measurement.

If the Reproduce Method is to be employed, a flutter test tape will be required.
Recommended test tape: Standard Tape Lab., #62, or equivalent.

In the Record/Reproduce Method, a 3KHz sine wave is recorded on a blank tape, rewound to beginning of the recording, and reproduced again for the measurement process.

NOTE:

When reproducing the recorded signal at measurements by the Record/Reproduce Method, adopt the maximum wow and flutter value obtained by repeated play and stop modes of operation which is necessary to be sure that wow and flutter content between record and reproduce will not be in phase to create a false reading.

B) Determine the Standard to be used.

The wow and flutter meter is set to measure either the IEC or ANSI peak value, or the NAB rms value, whichever is determined.

C) Whether the peak value or the rms value is adopted, the wow and flutter meter must be calibrated for "weighted" measurements.

D) As the measured results will vary with respect to location on tape at which it was taken, at least two points - at beginning and near the end of tape - should be selected for measurement.

NOTE:

Recommended Wow & Flutter Meters:

1) Meguro Denpa Sokki Co., Model MK-668B (Japan)
2) Mincom Div., 3M Co., Model 8100W (U.S.A.)

There will be slight differences in absolute value according to manufacturer.

	IEC/ANSI (peak value)	NAB (rms value)
Reproduce method	±0.06%	0.04%
Record/reproduce method	±0.08%	0.06%

g) Tape speed

Tape speed is measured by using Flutter Test Tape, which contain a highly accurate, continuous 3KHz tone.

Connect a digital frequency counter to either OUTPUT.

The indicated frequency should be 3KHz, ±0.5% for all speeds.

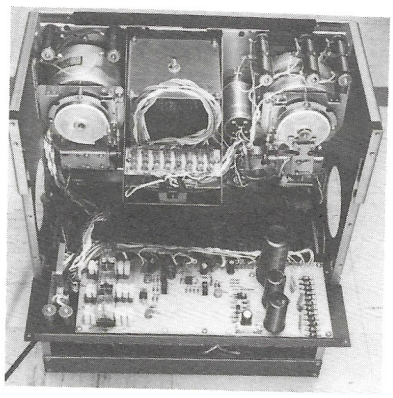
If tape speed is greatly offset from the specification, check pinch roller pressure and takeup tension for correct values, and see that the tape path is clean.

5.2.3 Power supply check and adjustment

Except for the power transformer and fuse holder, the 80-8 power supply components are all mounted behind the black aluminum rear panel (chassis).

The rear panel (chassis) can be swung out and down for easy access to the inner components by removing four screws on both edges of the panel.

Fig. H



* Supply voltage check *

1) Connect a voltmeter to No. 14 or 15 (plus side) and No. 11 or 12 (minus side) on the PCB wiring points. The voltage should not fluctuate beyond +27.5V and +30.5V when PLAY and STOP is quickly repeated.

   When the voltage is not within this range, the fault can be quickly located by comparing the actual voltage with those indicated in the power supply schematic.

2) Connect a voltmeter to No. 21 (plus side) and No. 19 (minus side) of the PCB wiring points. The voltage should be within the range of +5.0V and +5.3V. If the reading is off spec, adjust R101.

   It must be noted that this section of the supply has a current limiting circuit to prevent excess current flow cause by trouble in the load. R102 (22kΩ) is the trim pot for setting the maximum current and is generally set to limit at 2.5A. Therefore, it is usually unnecessary to touch the trim pot but if it must be re-adjusted, connect a voltmeter, ammeter and rheostat as shown in Fig.

Fig. I (a)

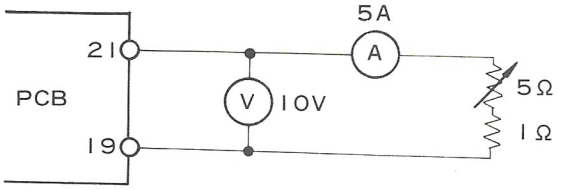


Fig. I (b)

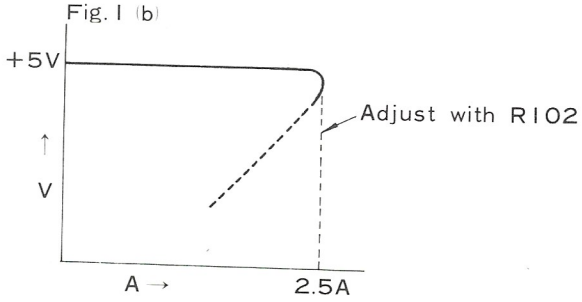
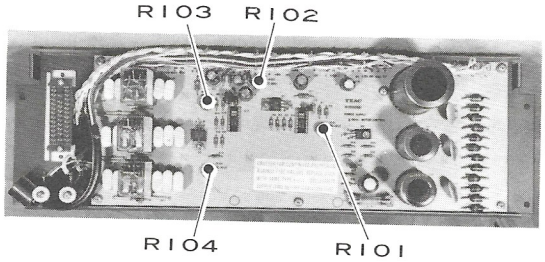


Fig. J



3) Connect a voltmeter to the PCB wiring points No. 30 (plus side) and No. 28 (minus side). The voltage reading should be between +23V and +25V. If it is off spec, adjust R103 (10KΩ).

Trim pot R104 (4.7KΩ) functions in the same way as R102 in the +5V supply.

If readjusting is necessary, set this for limiting at 1.6A.

5.2.4 Record/reproduce amplifier check and adjustment

Open the service door by removing the two set screws, one in each upper corner, of the front door.

Checking and adjusting can be most efficiently expedited by successively continuing to the end each procedure in the order explained in the following.

Fig. K

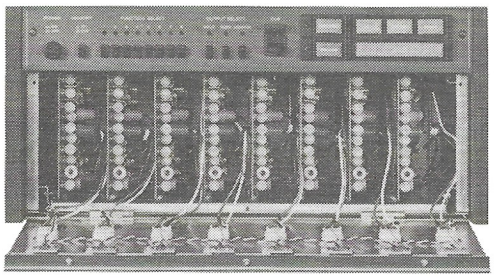
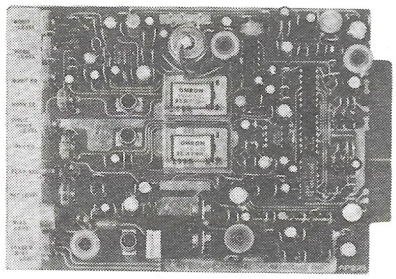


Fig. L

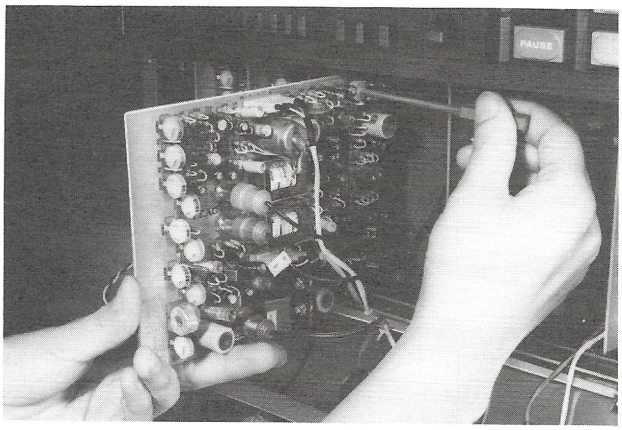


a) Setting of reproduce level
   1) Connect the AC voltmeter to the OUTPUT 1 pin jack on rear panel.
   2) Turn the machine ON and thread the test tape.
   3) Play the "operating level" portion (a voice on the tape identifies each section at the beginning).
   4) Switch the OUTPUT on the 80-8 to MONITOR. Then set output until the AC voltmeter reads -10dB (0.3V) by the trim pot marked MONIT LEVEL (R104, 10KΩ).
   5) Switch the OUTPUT SELECT to NORMAL. Then set output until the meter reads -10dB (0.3V) by the trim pot marked NORM LEVEL (R103, 10KΩ).

b) Meter calibration
   1) When the AC voltmeter reads -10dB (0.3V), the front panel meter should read 0VU.
   2) If it does not, then you must use the extender card (Part No. 6085 3030) to gain access to the proper control pot.
   3) Carefully remove the Channel 1 RECORD/REPRODUCE PC card from the machine. But do not unplug the cables that are attached to it. There is just enough wire on them to allow replacing the PC card and extender combination into the proper receptacle.

NOTE: When removing or replacing card, TURN MACHINE OFF.

Fig. M



4) Looking at the RECORD/REPRODUCE PC card from the component side and with the edge connector to the right, the upper right corner R105 (22KΩ) is the meter calibration pot.
5) Adjust R105 to obtain a OVU reading on the Channel 1 front panel VU meter when the AC voltmeter reads -10dB (0.3V).
6) After finishing the above adjustment, remove the test tape from the 80-8, turn off the power, and disconnect the card extender. Return the Channel 1 electronics to its proper receptacle.
7) Turn the power on and rethread the test tape. Plug the AC voltmeter into OUTPUT 2 pin jack. Play the "operating level" section of the test tape. Switch the OUTPUT SELECT to MONITOR, adjust trim pot R104 (10KΩ) on the Channel 2 RECORD/REPRODUCE PC card so that the AC voltmeter reads -10dB (0.3V).

   Switch the OUTPUT SELECT to NORMAL, adjust trim pot R103 (10KΩ) on the Channel 2 RECORD/REPRODUCE PC card so that the AC voltmeter reads -10dB (0.3V). Now read the Channel 2 meter.
   It should read OVU. If not, you must repeat the previous procedure for adjusting the meter circuit (card extender, etc.).
8) Adjust the remaining 6 channels in the same way.

c) Reproduce frequency response
1) Rethread the test tape after setting up the levels in all 8 channels.

   At checking and adjusting of the reproduce frequency response, itis more efficient to simultaneously check all 8 channels with the front panel VU meters instead of pluggging the AC voltmeter into the OUTPUT pin jacks one channel at a time. To be able to do so, the previous Meter Calibration must have been completed.

2) Switch the OUTPUT SELECT to NORMAL. Reproduce the phase, azimuth, and frequency response section of the test tape and check for a flat frequency response. If

necessary, adjust the trim pot marked NORM EQ, R101 (6.8KΩ). Trim the pot so that 10KHz will be flat with the 1KHz reference frequency. Then, see if the response is within ±2dB at 12.5KHz and 16KHz.

3) Switch the OUTPUT SELECT to MONIT. Reproduce the same sections of the test tape and check the response. If adjustment is necessary, trim the pot marked MONIT EQ, R102 (6.8KΩ).

It must be noted, however, that the MONITOR frequency response will be slightly inferior than NORM. This is due to emphasis placed on NORM, and MONIT is provided consistently for bias adjusting and simultaneous record/reproduce monitoring.

d) Record calibration

You can use the MONITOR head as a test instrument to check and adjust the record circuits. Almost all of the following steps involve recording a tone on a tape and reading the reproduce output of the recorder.

NOTE: Do not touch trim pots set during the previous reproduce adjusting procedures.

* Input level calibration and overload indicator adjustment *

1) Begin the record adjustments with the INPUT MON LEVEL trim pot on the Record/reproduce amplifier card.

Apply a 1KHz, -10dB (0.3V) signal to INPUT 1. Rotate the front panel knob to the "2 o'clock" position and mark this with a grease pencil for later reference.

Punch the INPUT button of the front panel OUTPUT SELECT buttons. If the VU meter does not read OVU, adjust the pot marked INPUT MONIT LEVEL, R 107, (22kΩ).

2) Raise to 0dB (1V) the 1KHz signal applied to INPUT 1. The overload indicator is functioning normally if the Channel 1 LED is ignited. Should the LED ignite before reaching 0dB or not ignite at this level, adjust R106 (22KΩ) on the Record/reproduce amplifier card.

3) Should it be necessary to adjut R106, the extender card must be used again. Refer to "Meter calibration" 2) and 3).

4) Looking at the RECORD/REPRODUCE PC card from the component side and with the edge connector to the right, R106 is the second pot from the upper right hand corner. This is adjusted so that the LED ignites when the INPUT 1 signal level is raised to 0dB (1V).

NOTE: The LED will remain ignited although the level is lowered by about 1.5dB due to hysteresis but this is normal.

5) Check and adjust the remaining 7 channels in the same way.

e) Bias level

1) Record a 10KHz test tone.
2) Set OUTPUT SELECT to MONITOR.
3) Adjust the front panel INPUT so that the VU meter indicates a conveniently read value.
4) The trim pot to adjust is R112 (50KΩ) marked BIAS LEVEL.
5) It is first rotated fully CCW, then slowly rotated CW.
6) The VU meter will slowly rise, reach the peak, then begin to fall again. The trim pot is set 3dB beyond and below this peak.
7) Should the VU meter scale out during this procedure, retard the INPUT knob slightly and repeat the above procedure.
8) Repeat the same procedures on the remaining 7 channels.

f) Record level

The following adjustments are done only after the reproduce level is set and the bias level set to specification.

1) Put the 80-8 in the record mode and record a 1KHz, -10dB (0.3V) signal. Set the front panel INPUT level knob to the 2 o'clock position (previously marked on the panel).
2) Set the OUTPUT SELECT to MONITOR.
3) Adjust the trim pot R110 (10KΩ) marked REC LEVEL to obtain a OVU reading on the front panel VU meter.
4) An AC voltmeter plugged into the record channel OUTPUT should indicate -10dB.
5) If not, trim pot R105 (22KΩ) is out of adjustment and the meter must be recalibrated (Refer to Meter Calibration, page 18).
6) Rewind the above recorded 1KHz signal to the beginning, set OUTPUT SELECT to NORM, reproduce the 1KHz signal and check for a OVU, ±0.5VU reading on the VU meter.
7) If it does not read OVU, readjust the reproduce level setting (Refer to "a) Setting of reproduce level," page 18).

g) Record equalization

There are two trim pots for Record Equalization on the 80-8. One, marked REC EQ (R108, 3.3KΩ) is for shifting the high frequency peak, and the other, marked PEAK ADJ (R109, 470Ω) is for raising or lowering the peak.

1) Put the 80-8 in the record mode and record a 1KHz, OVU (-10dB) signal.
2) For a quick check, use the front panel VU meter but for critical adjustments plug an AC voltmeter into the OUTPUT pin jack.
3) Set OUTPUT SELECT to MONITOR and monitor with the VU meter or the AC voltmeter.
4) Then, raise the record frequency to 15KHz, OVU (-10dB) and check the difference

from 1KHz.

5) The difference should be within ±2dB.
6) Should it be off spec, adjust R108.
7) Adjust REC EQ, R108 for frequencies from 10KHz through 15KHz, and PEAK ADJ, R109 for frequencies above 15KHz.

NOTE: Please be fully aware of the difference in range between NORM reproduce and MONITOR reproduce when checking the overall frequency response by the MONITOR mode or you may do the wrong adjustment.

h) Signal-to-noise ratio measurement

Prior to measurement, demagnetize all heads and tape guides as described in Item 5.1, d), page 8.

1) Before signal-to-noise ratio measurement, be sure the Item 5.2.4 Record/reproduce amplifiers are checked out and if required, properly adjusted.
2) Connect the AC voltmeter to OUTPUT 1 pin jack on rear panel.
3) Record a certain legnth of OVU, 1KHz signal, then while still in the recording mode, unplug the oscillator to INPUT 1 pin jack on rear panel and make another length of no-signal recording.
4) Set OUTPUT SELECT to NORM.
5) Rewind the recording made in Item 3) to beginning and reproduce it.
6) Making sure the reproduce output of the previously recorded 1KHz, OVU signal is -10dB, then raise sensitivity of the AC voltmeter and measure the level of the no-signal portion of the tape.
7) With OVU as the reference level, the signal-to-noise ratio as measured by the AC voltmeter, should be larger than 48dB.
8) If it is off spec:
    * Demagnetize the head.
    * Check erasure [Refer to Item 5.3.3, c)]
    * Check and compare measurements of other channels. If they stand up to spec, correct or repair the off spec channel Record/reproduce amplifier PCB.
    * Check for proper adjustment of the bias trap.
    * Try another tape of same type No.

5.3 CORRECTIVE MAINTENANCE

5.3.1 Preliminary disassembly procedures

a) Power supply unit

The power supply unit can be completely detached from the frame by first removing both side boards, removing the four screws securing the power supply rear panel and tilting the panel outward, unplug the 34 pin connector on the left side, also unplugging the 7 pin round inter-cable connector, and removing one screw on each side serving as the hinge. The power supply together with the rear panel can then be lifted out.

b) Control unit

To remove the control unit, the dress panel is first removed by taking off the two screws, one on each side, then removing the 4 screws, two on each side just under the previously removed two screws, then pulling the unit out and forward. To completely pull out the unit, the two blue colored card-edge connectors at the back side of the unit are unplugged. Then, cables with 3 pin and 4 pin connectors plugged into receptacles amidst the PC components are unplugged, another inter-cable connector on the right hand end of the PC is unplugged. For the next step, the 12 pin REMOTE connector on the rear panel is pushed in after removing the two screws securing it, and lastly unsoldering the wires to the power switch.

c) Record/reproduce amplifier assembly

The record/reproduce amplifier front panel is tilted forward by removing one screw each on the left and right side of the panel, then removing the 6 screws securing the Pin Jack Board on the rear panel. The whole amplifier assembly can then be pulled out from the front after removing four screws on each side of the frame, accessible through holes in the frame.

d) Head assembly

1) Tilt forward the record/reproduce amplifier front panel by removing one screw each on the left and right side of the panel.
2) Unplug the 24 pin plugs inserted into jacks on the amplifier PC cards.
3) Remove the top cover by taking off the 9 screws securing it.
4) Fully tilt backward to a horizontal position by removing the 4 screws securing the power supply rear panel.
5) Loosen the head cable clamp on the capstan assembly thrust plate and free the cable so that it can easily be pulled out.
6) Remove the head housing by taking off the two screws securing it.
7) Take off the 4 hex screws securing the head assembly base plate and carefully lift up the head assembly from the transport.

8) Pull out the pin plug cables two or three at a time through the transport panel hole.

9) Each head can be removed from the assembly by unscrewing two hex screws for each head, from the bottom of the base plate.

5.3.2 Disassembly and replacement of assemblies

a) Capstan motor assembly (See page 36)

1) Remove the 3 screws holding the capstan motor.

2) Unsolder the 6 wires connecting the capstan motor.

3) Remove the 4 screws holding the capstan motor. Watch for the Rubber Cushions.

4) Loosen the 2 set screws (hex head) in pulley and lift off pulley.

NOTE: *Clean the drive belt with TZ-261B Cleaning Fluid, and the motor pulley and capstan flywheel with TZ-261A Cleaning Fluid.

*Be sure to note the wire color codes so that you can replace them correctly to their original connections.

b) Capstan assembly (See page 36)

1) Unscrew capstan cover (front panel).

2) Remove 2 screws from rear bracket, allow bracket to drop toward floor of cabinet.

3) Remove capstan belt.

4) Loosen 2 screws in capstan assembly.

5) Gently move capstan assembly up and down until it slides out of panel.

c) Reel motor assembly (See page 31)

1) Disconnect the 4 motor wires from terminals and release wire harness straps.

2) Loosen 2 set screws (hex head) in Brake Drum and 2 in the Reel Turntable assembly. Lift off these parts.

3) Remove 4 screws securing the Brake Assembly to the motor. Carefully lift off the Brake Retainer with its 2 wires still connected to the Brake Solenoid.

4) Remove 4 screws securing Reel Motor to chassis through the front panel.

NOTE: Reel motor assemblies are mirror images of each other; these assemblies are not interchangeable.

d) Tension arms, left and right (See pages 40 and 42)

CAUTION: Do not over-tighten screws holding the right tension arm. Insulating spacer and micro-switch are easily broken by excess pressure.

IMPORTANT: After reassembly, check clearance to ascertain that arm moves freely.

5.3.3 Record/reproduce amplifier PC card adjustment

a) Bias trap adjustment

Bias trap adjustment is not required other than at the following:

* When the head is replaced
* When the record/reproduce PC card is replaced
* When there is increase in bias leakage

Bias traps L1, L2, and L3 are provided in each record/reproduce PC card.

L1 and L2 (Reproduce)

1) Plug an AC voltmeter (preferably an oscilloscope also in parallel) to the OUTPUT 1 pin jack on rear panel.
2) Carefully remove the Channel 1 record/reproduce PC card from the 80-8 without unplugging the cables to it, install an extender card to it, and reinsert it into the proper connector.

NOTE: When removing or replacing the PC card, TURN MACHINE OFF.

3) Lock the right tape tension arm so that the shut-off switch does not turn off the 80-8. Punch 'in' the FUNCTION SELECT buttons for all channels and set OUTPUT SELECT to NORM.
4) Turn ON the 80-8 and put in the record mode.
5) Raise the AC voltmeter sensitivity and check the bias leakage. It should be less than -40dB.
6) If it is higher than permissible, adjust L1 for minimum leakage with a non-inductive screwdriver.
7) Then, adjust L2, also for minimum leakage.

L3 (Record)

8) Connect the GND side of an AC voltmeter or oscilloscope to pin #4 (0V) of T3, and the HOT side to the junction between L3 and C32 (Refer to Fig. 8.8, page 95).
9) Put the 80-8 in the record mode and adjust L3 for minimum leakage.

b) Inter-stage transformer tuning

1) Switch OFF the 80-8.
2) Carefully remove the Channel 1 record/reproduce PC card from the 80-8 without unplugging the the cables to it, install an extender card to it, and reinsert it into the proper connector.

NOTE: When removing or replacing the PC card, TURN MACHINE OFF.

3) Connect an AC voltmeter or oscilloscope to the terminals of J3 (erase head) and adjust T2 for maximum output.

c) Erasure

A 1KHz band pass filter or frequency analyzer is required for measuring erasure.

1) A test tone (1KHz) is recorded, the tape rewound to beginning of this recording, the tape run through a second time in the record mode with the record INPUT shorted, and the residual 1KHz component measured.
2) It is within spec if the ratio between the initially recorded 1KHz signal and the erased portion is more than 65dB.
3) Should erasure be insufficient, slowly rotate CW the trim pot marked ERASE & BIAS LEVEL, R111 (1KΩ) until a ratio of 65dB is obtained.

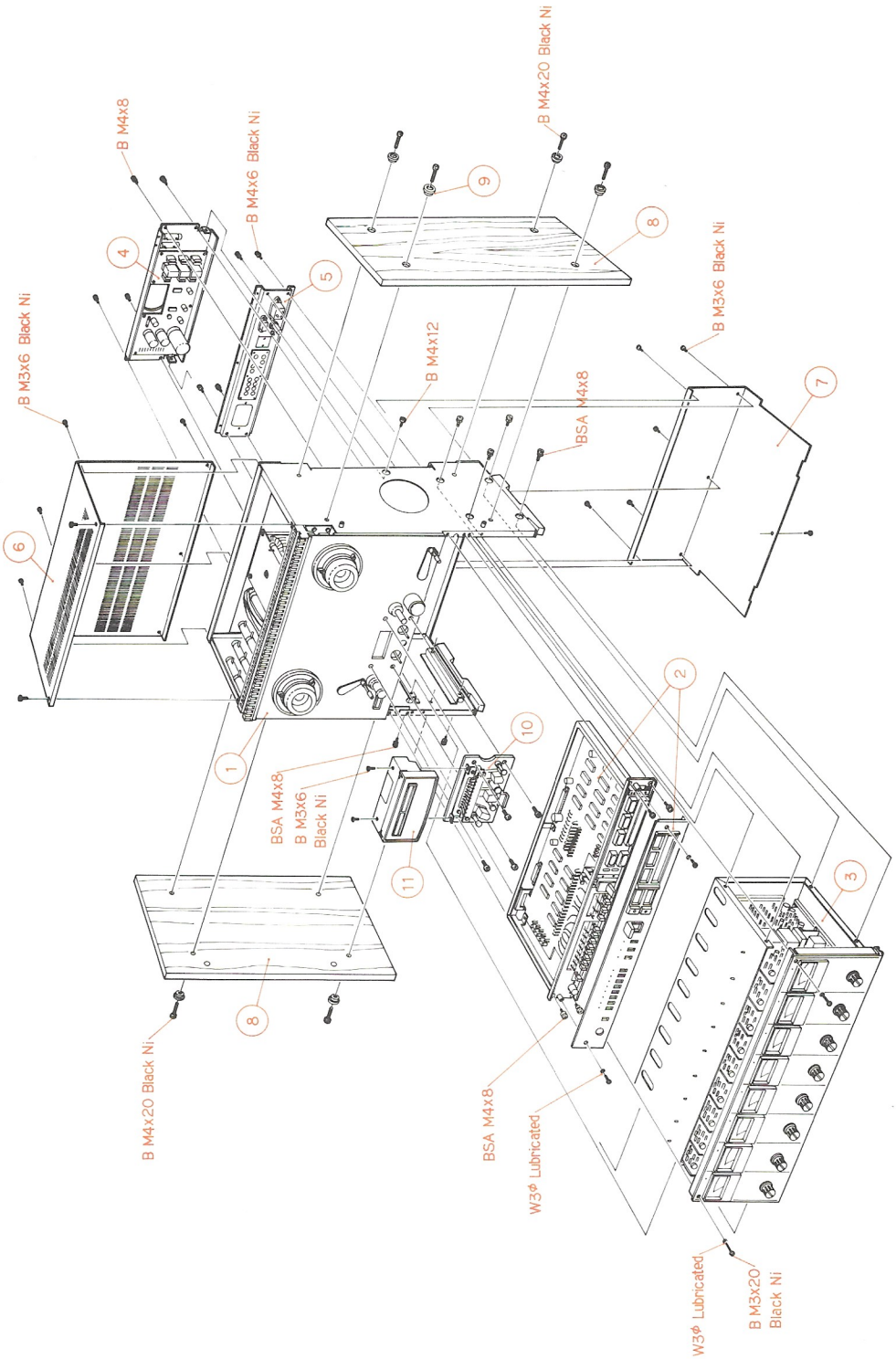
NOTE 1: Readjust the bias as bias current will also change with adjustment of the erase current.

NOTE 2: The voltage at J3 (for erase head), measured on an oscilloscope (Imp.>1M , <25pF), for a 65dB erasure is 110V p-p.

If sufficient erasure cannot be obtained although a higher voltage than this is applied, check the head face for accmulated tape oxide or improper tape travel and/or touch over the head face.

6. EXPLODED VIEWS AND PARTS LIST

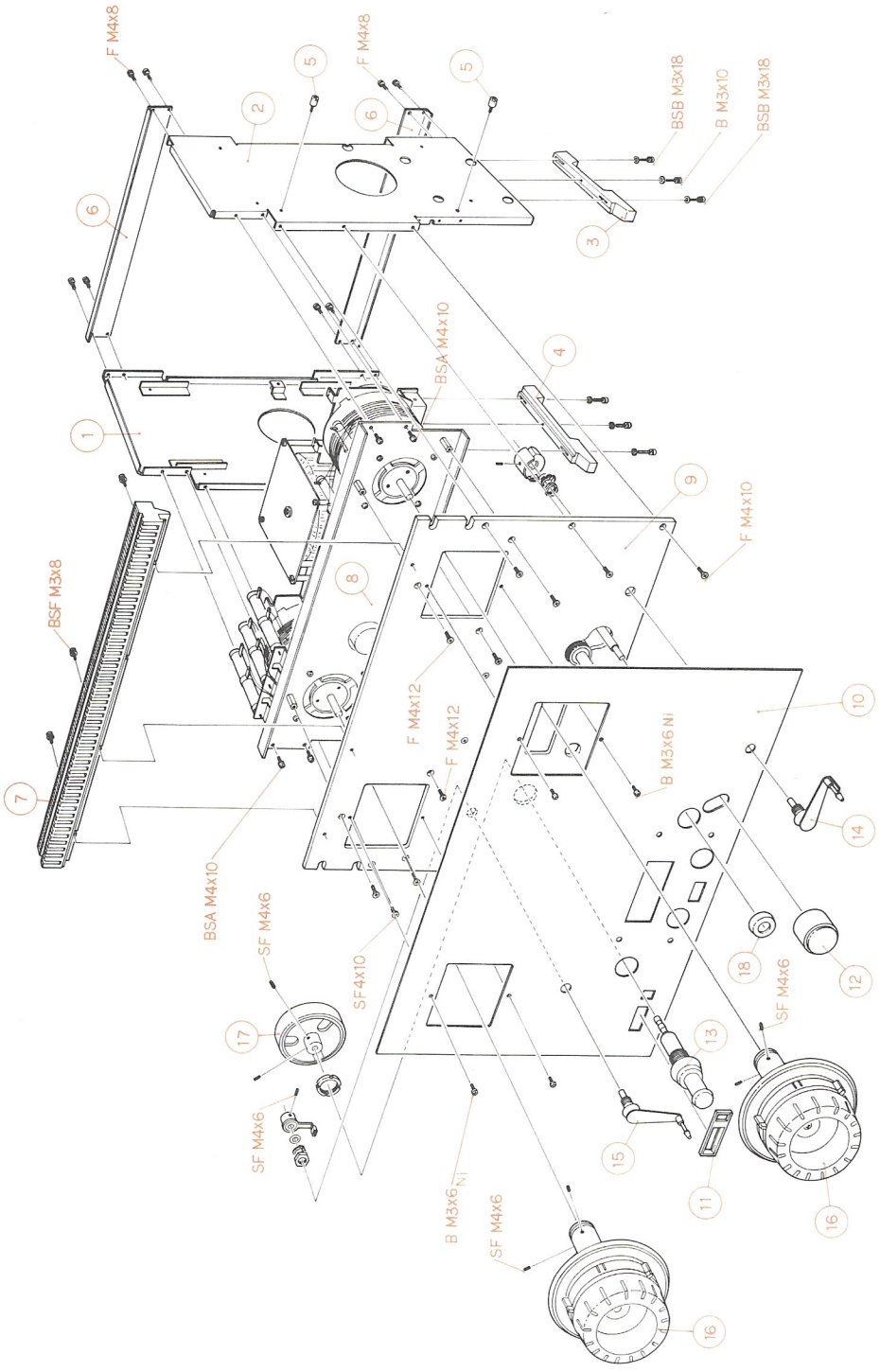
6.1 Preliminary disassembly



Title	Preliminary Disassembly, TEAC Tascam Series 80-8	
Ref. No.	Description	Parts No.
01	Tape transport assembly (See p. 29)	6070 0190
02	Control unit assembly (See p. 44)	6080 0260
03	Rec/repro amplifier assembly (See p. 46)	6085 2580
04	Power supply unit (See p. 48)	6080 0290
05	Rear panel assembly (See p. 50)	6085 2550
06	Cover, top	6038 2711
07	Cover, bottom	6038 2720
08	Board, side dress	6038 2740
09	Washer	5027 6931
10	Head assembly (See p. 52)	6013 0180
11	Head housing assembly (See p. 52)	6013 0170

PARTS LIST
Preliminary disassembly
REV. 1

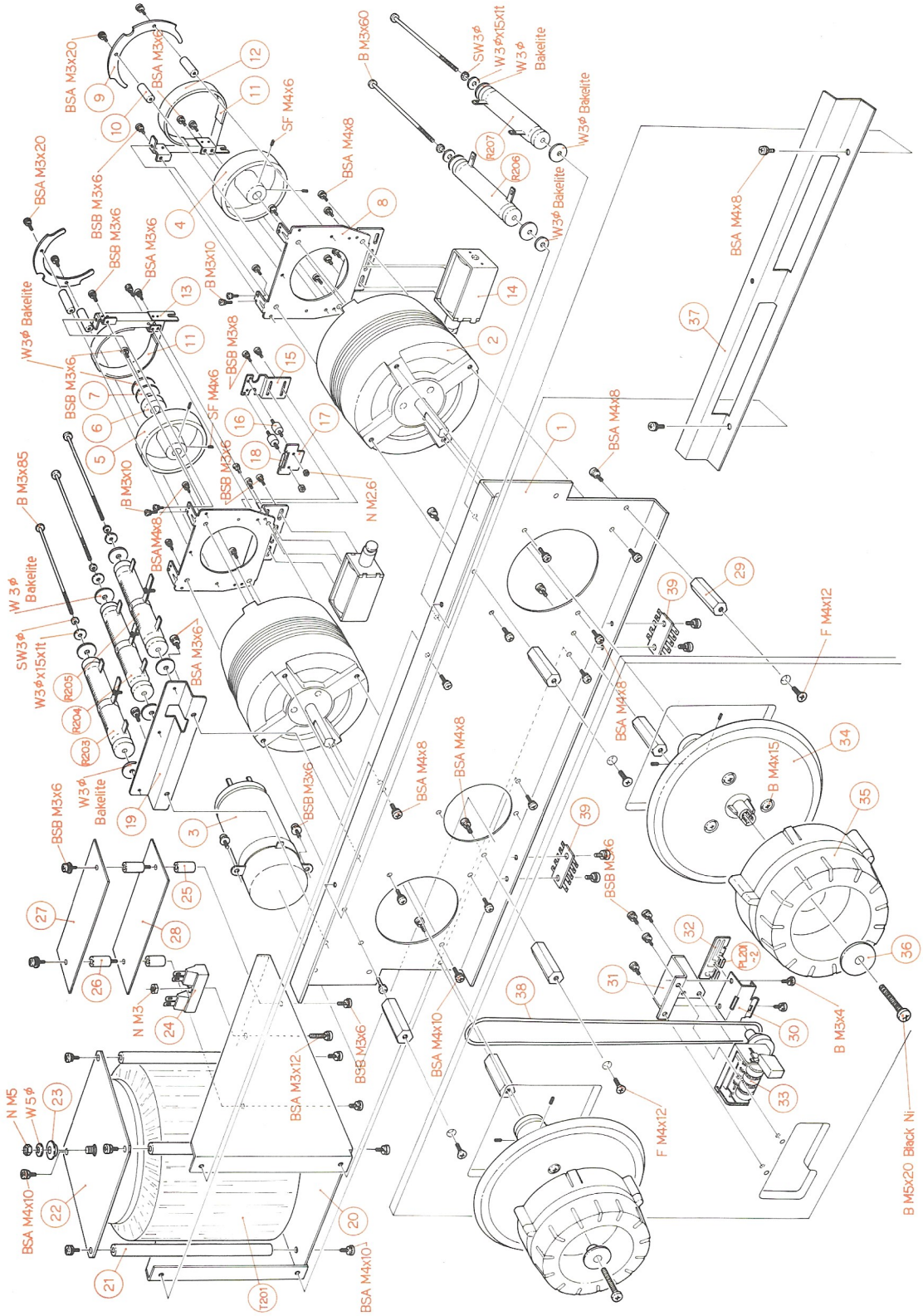
6.2 Tape transport assembly



Title	Tape Transport Assembly	
Ref. No.	Description	Parts No.
01	Chassis, side, left	6010 0040
02	" , " , right	6010 0050
03	Foot, plastic mold, right	5533 0180
04	" , " " , left	5533 0190
05	Screw, stud, side board positioning	5581 0370
06	Angle, rear cover mount	5023 5312
07	Grille, air vent	6038 2730
08	Reel motor ass'y (See p. 31)	6012 0140
09	Panel, sub top	6010 2720
10	Panel, dress	6010 2730
11	Escutcheon, counter	5534 0250
12	Pinch roller ass'y (See p. 34)	6011 0220
	Collar, ball bearing	6011 2660
	Cap, pinch roller	5014 2180
13	Impedance roller ass'y (See p. 38)	6011 0250
14	Tension arm, right (See p. 40)	6014 0560
15	Tension arm, left (See p. 42)	6014 0570
16	Reel table ass'y	6012 0120
17	Flywheel, impedance roller	5530 5060
18	Cap, dust, capstan	6011 2630

PARTS LIST
Tape transport ass'y
REV. _____

6.3 Reel motor assembly



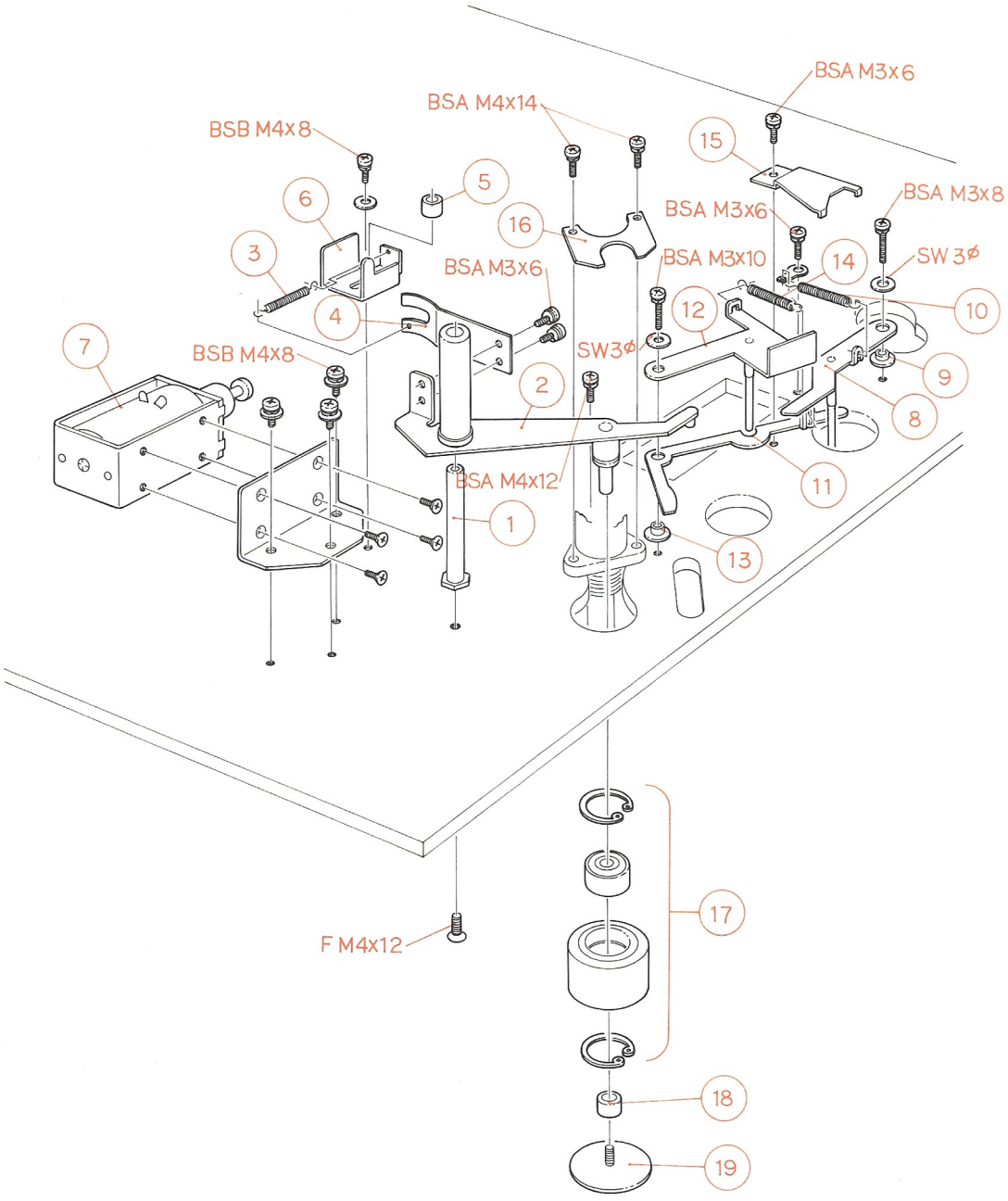
Title	Reel Motor Assembly	Assembly No. 6012 0140
Ref. No.	Description	Parts No.
01	Plate, base, reel motor	6010 2741
02	Motor, reel	7070 2283
03	Capacitor, MP (4 + 1) X 2, 250WV	5054 5800
04	Drum, brake, right	6012 0110
05	" , " , left	6012 2310
06	Magnet	5015 2392
07	Oil seal	5012 3900
08	Plate, base, brake	5017 3601
09	Brake retainer	5017 3481
10	Standoff, brake	5017 3490
11	Felt, brake	5554 1560
12	Brake band ass'y, left	5017 3332
13	" " " , right	5017 3392
14	Solenoid, brake	6047 5100
15	Bracket, reed switch	6014 4880
16	Cushion, rubber	7111 1901
17	PCB, reed switch	6050 0510
18	Switch, reed	5044 7200
19	Bracket, resistor mount	6014 4800
20	" , power transformer mount	6014 4951
21	Standoff, power transformer	6004 9420
22	Plate, power transformer	6014 4960
23	Washer, insulator	6014 4971
24	Terminal strip, 2P	5043 8350
25	Spacer, threaded	6004 8870
26	Spacer, threaded	6004 9040
27	PCB ass'y, fuse (See p. 55)	6080 0300
28	PCB ass'y, terminal (See p. 56)	6080 0420
29	Support, motor	5016 1950
30	Bracket, lamp	6014 5900
31	" , tape counter	6014 5890
32	PCB ass'y, lamp	6050 3220
33	Counter, tape	5058 5150
34	Reel table ass'y (w/o reel holder)	6012 0310
35	Holder, reel	6012 0130

PARTS LIST
Reel motor ass'y
REV. 1

Ref. No.	Description	Parts No.
36	Plate, reel holder mounting	6012 2610
37	Bracket, top cover support	6014 6030
38	Belt, tape counter	5534 0110
39	Terminal, strip, 5P	6053 0160
R203, 204	Resistor, wirewound, 50Ω, 30H	6040 2190
R205	" , " , 200Ω, 30H	6040 2200
R206	" , " , 80Ω, 10H	6040 2260
R207	" , " , 33Ω, 10H	6040 2210
T201	Transformer, power, 100/117V	6046 0590
	" , " , 220/240V	6046 0610
PL201,202	Lamp, tape counter	6046 8100

PARTS LIST
Reel motor ass'y
REV. _____

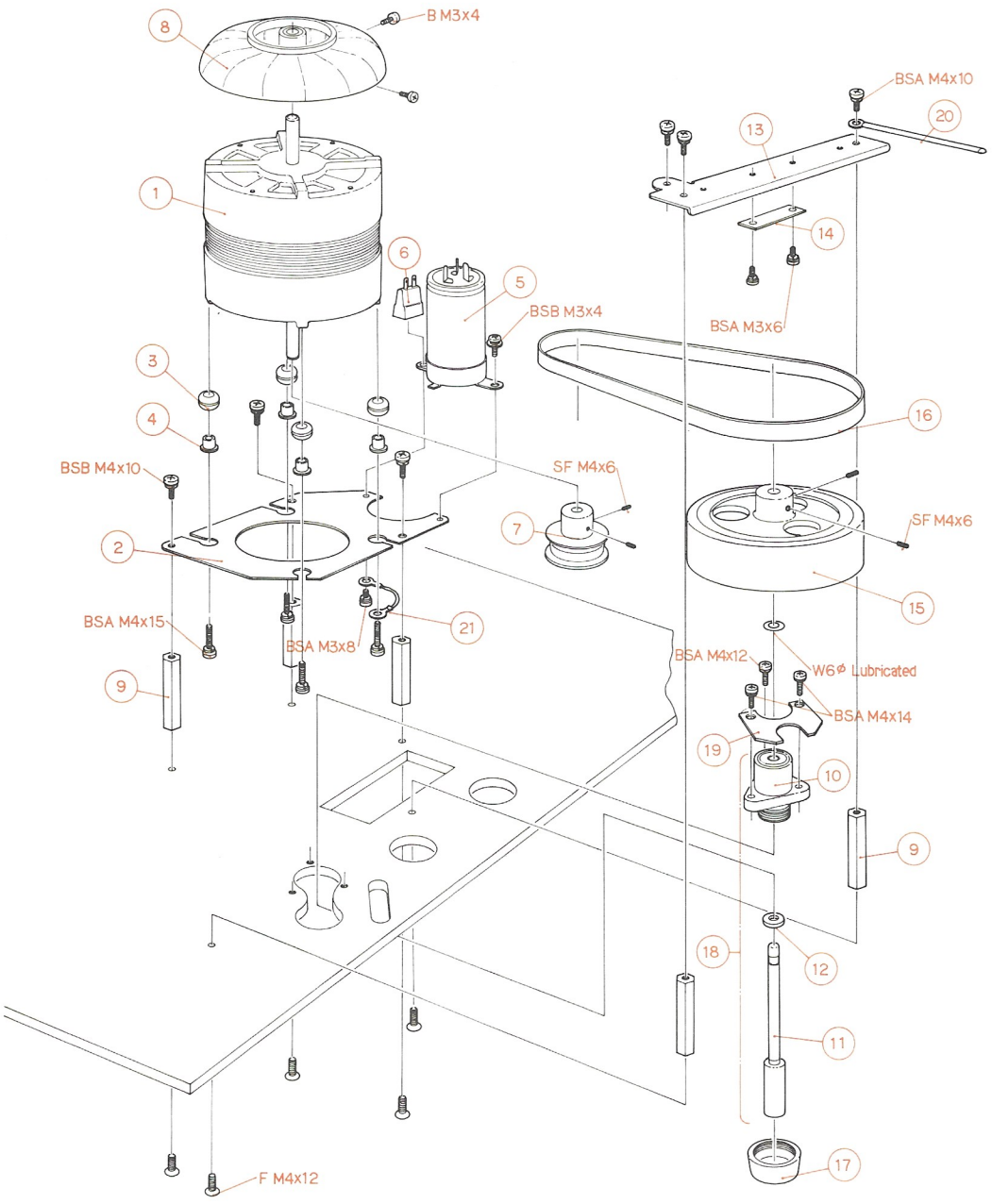
6.4 Pinch roller/ lifter section



Title	Pinch Roller/Lifter Section	
Ref. No.	Description	Parts No.
01	Shaft, pinch roller arm	5014 1821
02	Arm ass'y, pinch roller	6011 0210
03	Spring, return	5524 0080
04	Spring, pressure	5520 0620
05	Rubber, cushion	5027 5690
06	Limit stop, pinch roller	5014 1842
07	Solenoid, capstan	5163 0040
08	Lifter arm ass'y, R	6014 0490
09	Shaft, lifter arm	5015 2502
10	Spring, A	5022 1100
11	Arm, cue	6014 4740
12	Cue lifter ass'y	6014 0500
13	Shaft, cue lifter arm	5544 0221
14	Spring, cue lifter	6004 0400
15	Plate, lifter, B	5554 0610
16	Plate, roller arm rest	5014 2190
17	Pinch roller ass'y	6011 0220
18	Collar, ball bearing	6011 2660
19	Cap, pinch roller	5014 2180

PARTS LIST
Pinch roller/lifter section
REV. _____

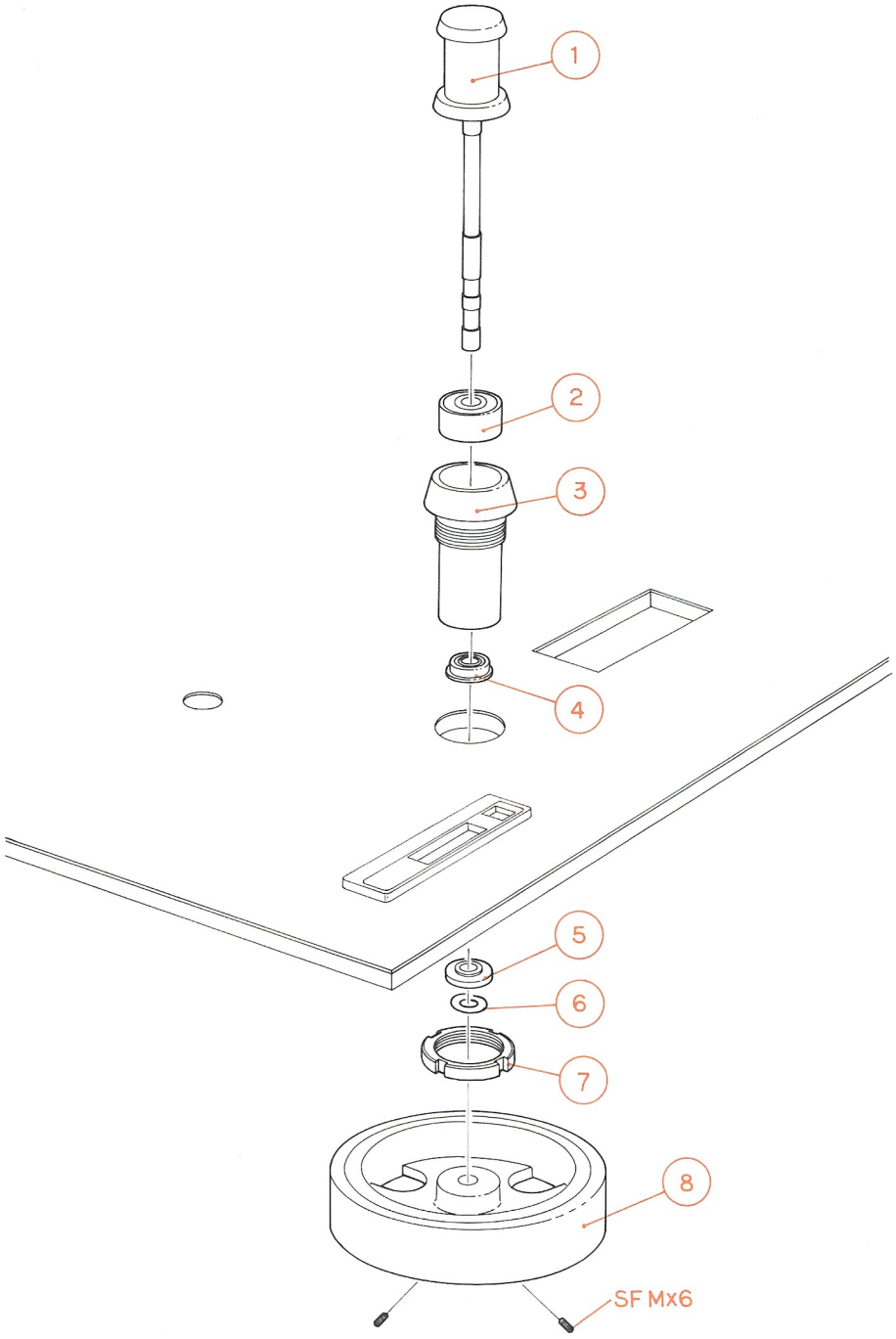
6.5 Capstan motor assembly



Title	Capstan Motor Assembly	
Ref. No.	Description	Parts No.
01	Motor, capstan	5070 1341
02	Plate, capstan motor	6011 2730
03	Cushion, rubber	5070 6211
04	Spacer, rubber cushion	5033 2790
05	Capacitor, MP, (2+0.8)uF/250WV	5054 5650
06	Terminal strip, 1-lug	6053 0170
07	Pulley, motor, 60Hz	6011 2720
	" , " , 50Hz	6011 2900
08	Fan, motor cooling	5012 3984
09	Standoff, capstan motor	5012 3860
10	Bearing, capstan	5012 0211
11	Shaft, capstan	6011 2680
12	Oil pad ring	5012 3900
13	Angle, thrust plate	5554 0580
14	Plate, thrust	5027 7232
15	Flywheel, capstan	5012 3802
16	Belt, capstan	5012 5340
17	Cap, dust, capstan	6011 2630
18	Capstan ass'y	6011 0260
19	Plate, arm rest	5014 2190
20	Clamp, cable harness	6014 4890
21	Wire, motor grounding	5047 7830

PARTS LIST
Capstan motor ass'y
REV. 1

6.6 Impedance roller assembly

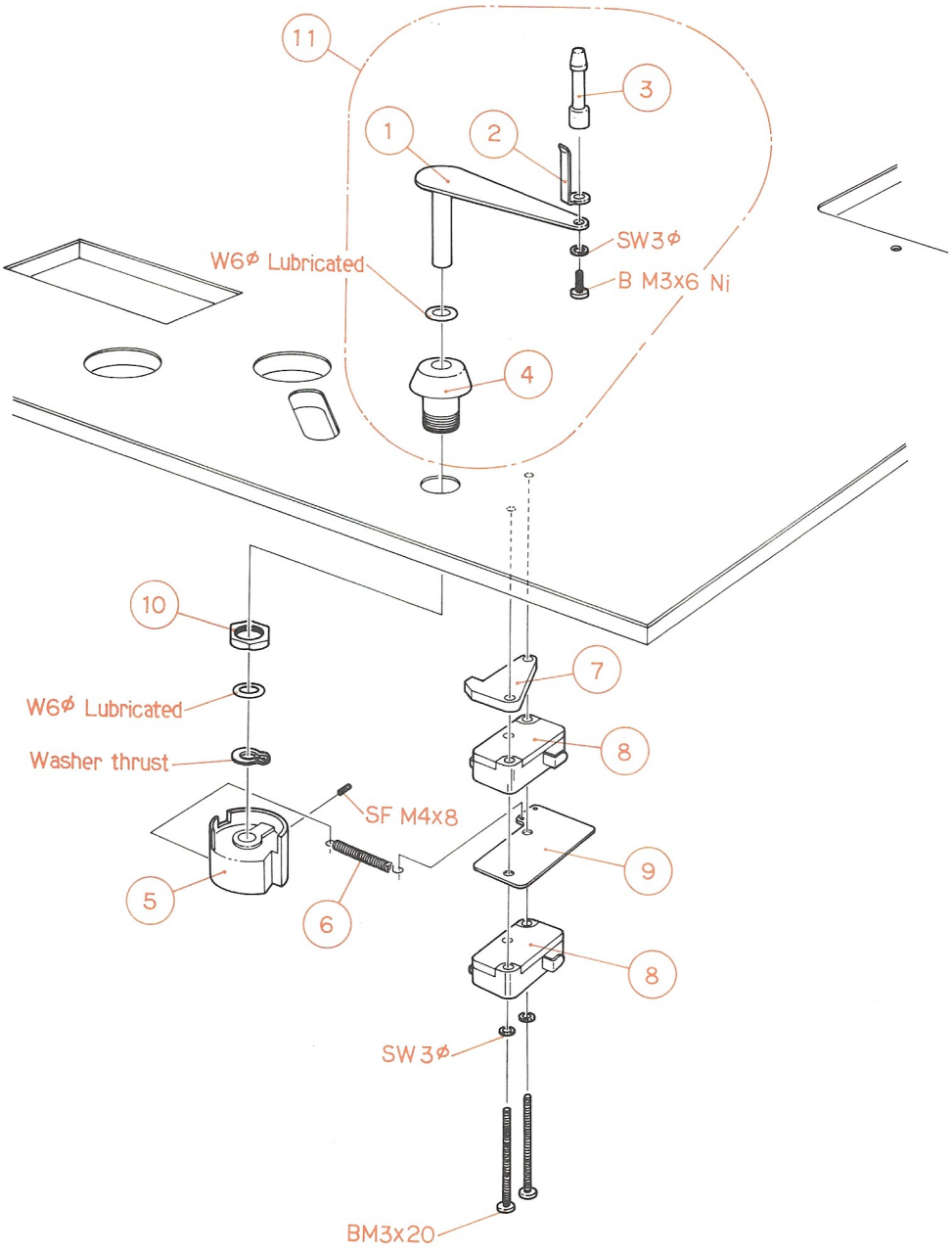


Title	Impedance Roller Assembly	Assembly No. 6011 0360
Ref. No.	Description	Parts No.
01	Roller, impedance	6011 0200
02	Bearing, ball (626VV)	5500 2160
03	Bushing, bearing	6011 2710
04	Bearing, ball (MF126ZZ)	6004 6640
05	Collar, impedance roller	5540 5070
06	Washer, spring friction	5520 2000
07	Nut, bushing mount	6011 2690
08	Flywheel, impedance roller*	5530 5060

* Not included in Assembly No. 6011 0360

PARTS LIST
Impedance roller ass'y
REV. 1

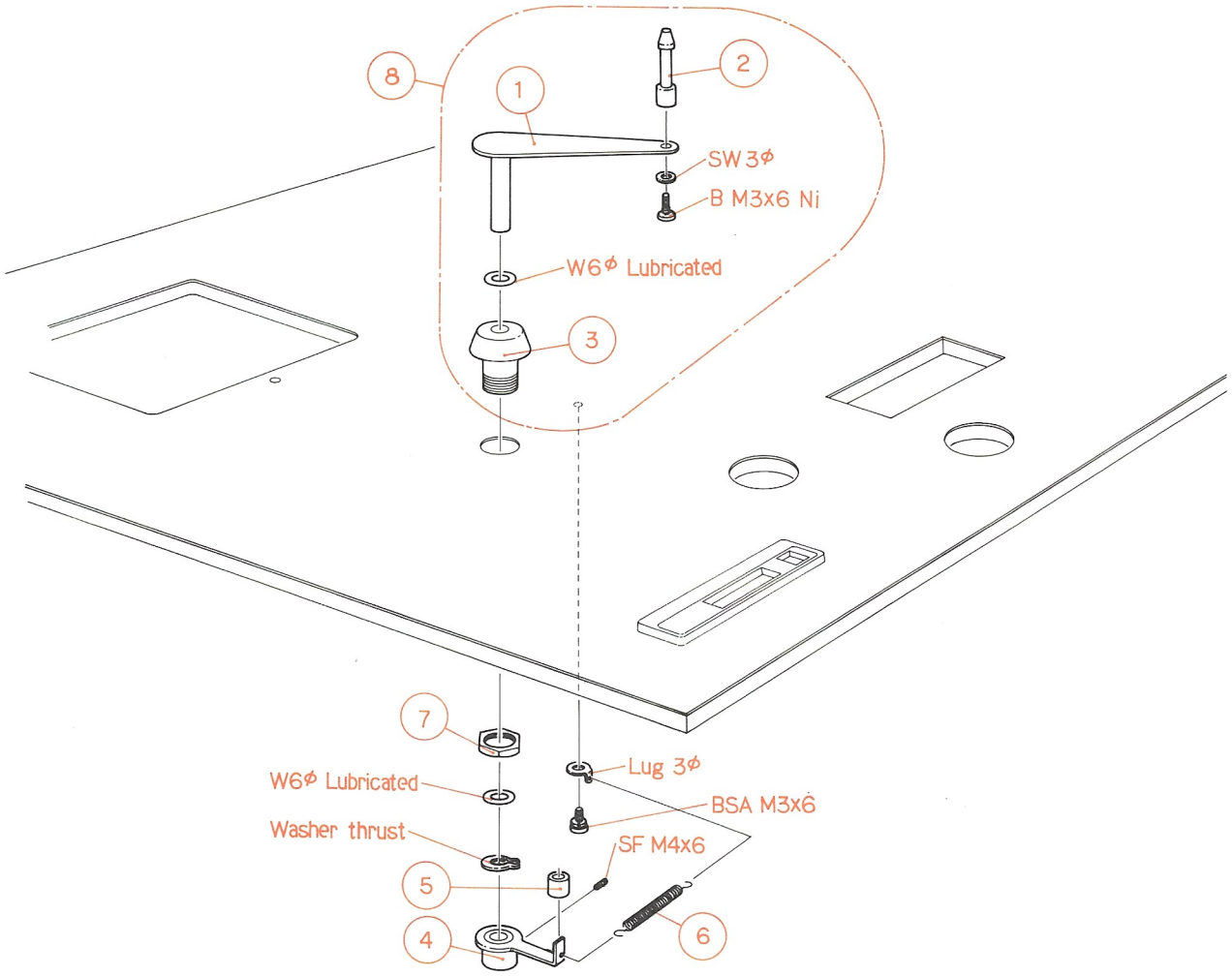
6.7 Right tension arm



Title	Right Tension Arm	
Ref. No.	Description	Parts No.
01	Arm, tension	6014 0510
02	Hook, tape	6014 4830
03	Guide, tape, right	6014 4820
04	Holder, arm, C	5530 0831
05	Drum, switch OFF	5018 3821
06	Spring, C	5022 1122
07	Limiter, tension	5018 2730
08	Switch, micro	5130 0010
09	Insulator, paper	5018 3932
10	Nut, M9, tension arm	
11	Right tension arm assembly	6014 0560

PARTS LIST
Right tension arm
REV. 1

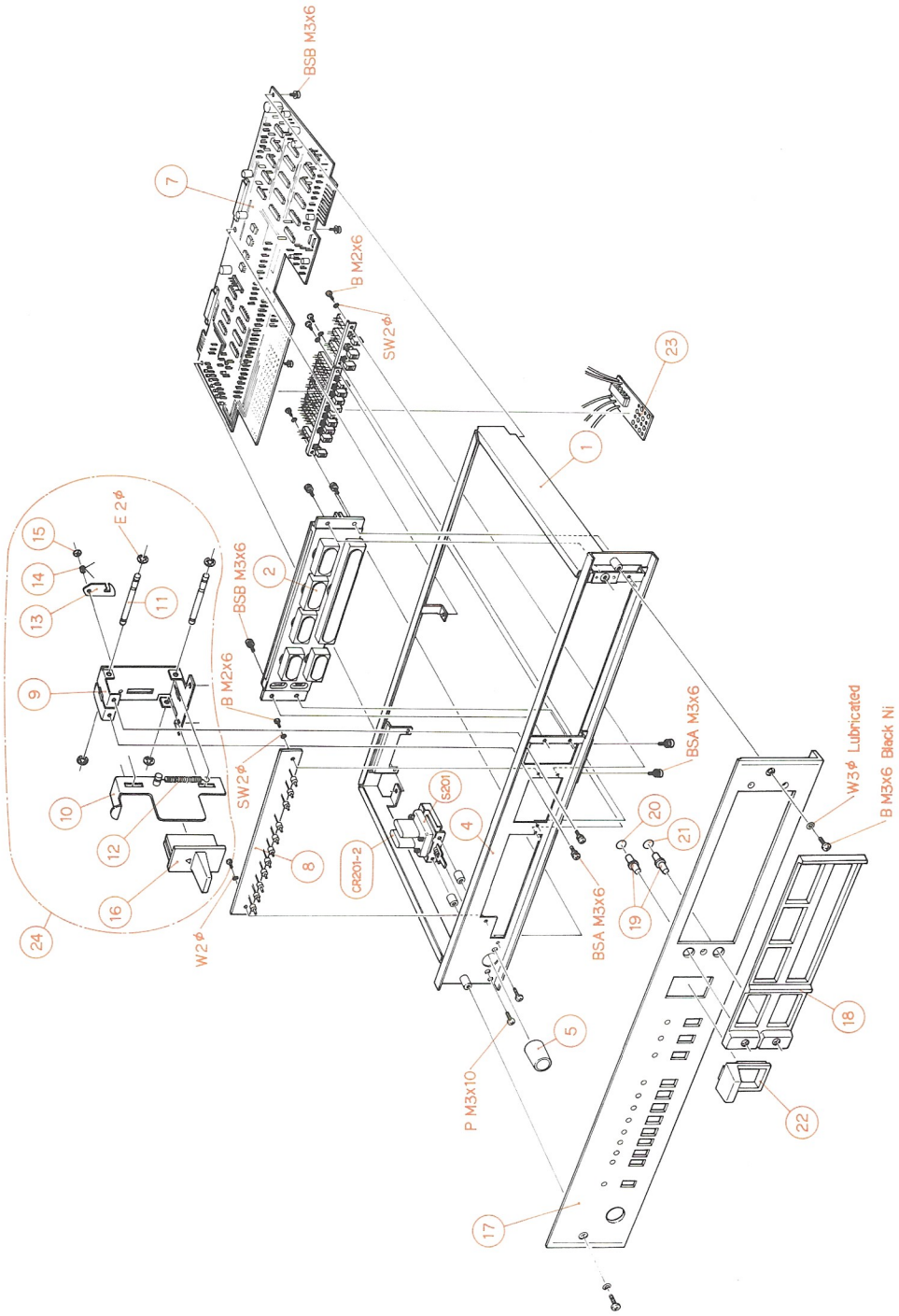
6.8 Left tension arm



Title	Left Tension Arm	
Ref. No.	Description	Parts No.
01	Arm, tension	6014 0510
02	Guide, tension arm	6014 4810
03	Bushing, arm shaft, C	5530 0831
04	Limit stop, tension arm	6014 0520
05	Collar, rubber	5027 6990
06	Spring, tension arm	6004 0370
07	Nut, M-9, tension arm	
08	Tension arm ass'y	6014 0570

PARTS LIST
Left tension arm
REV. _____

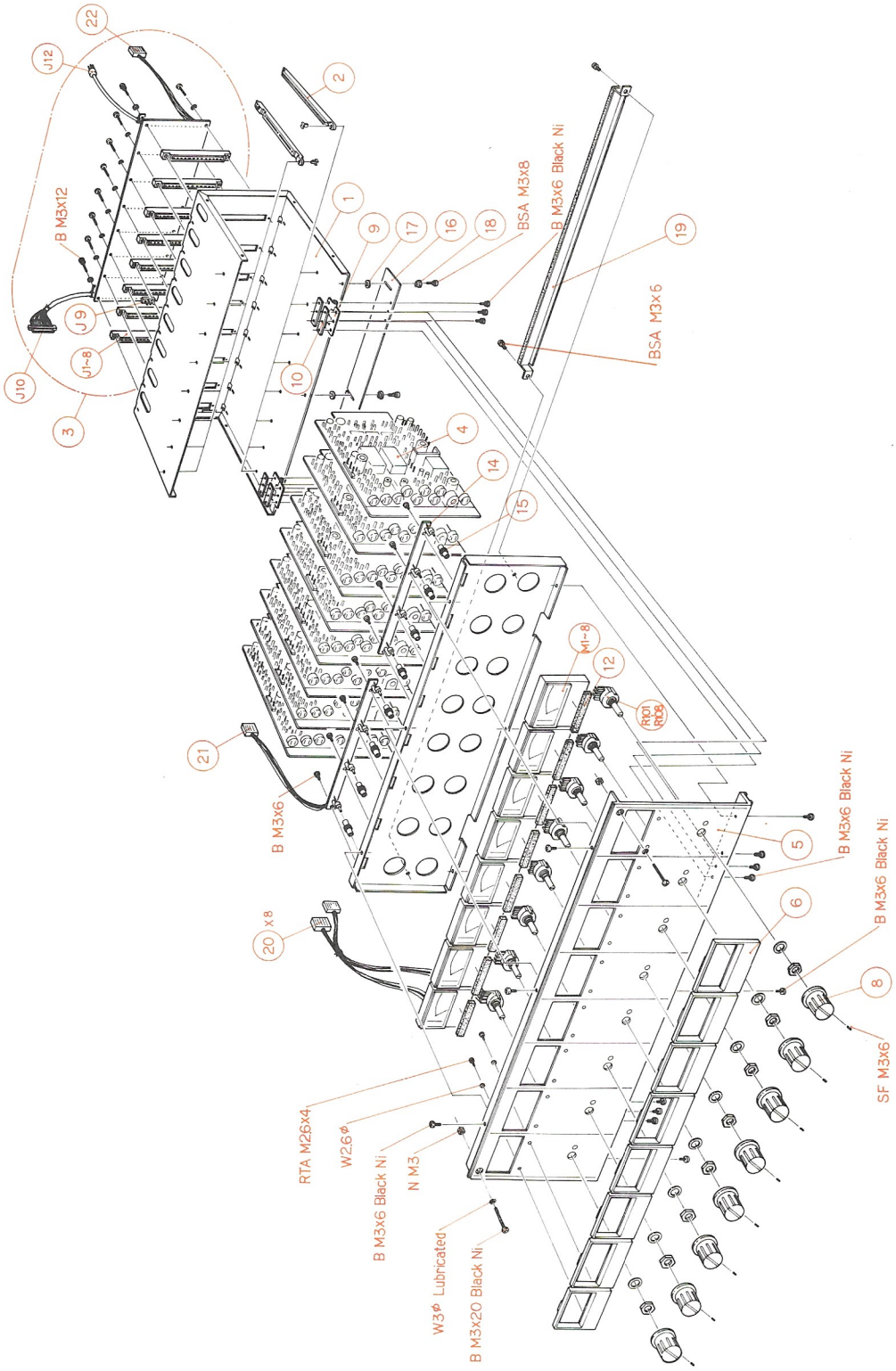
6.9 Control unit assembly



Title	Control Unit Assembly	Assembly No. 6080 0260
Ref. No.	Description	Parts No.
01	Chassis, control unit	6010 0060
02	Key board switch ass'y B	5044 8611
03	(deleted)	
04	Standoff, power switch	6004 8050
05	Button, power switch	6006 0190
06	(deleted)	
07	PCB ass'y, system control (See p. 58)	6080 0270
08	PCB ass'y, LED indicators (See p. 73)	6080 0310
09	Guide ass'y, cue linkage	6014 0470
10	Linkage ass'y, cue	6014 0480
11	Shaft, linkage guide	5544 0330
12	Spring, cue linkage	6004 0390
13	Plate, pause lock	5550 0270
14	Spring, lock plate	5520 0161
15	Nut, speed, M1.5	
16	Lever, cue	5530 5150
17	Panel, control	6010 2691
18	Escutcheon, tape control	5530 5310
19	Lens, lamp	5530 5260
20	Film, filter, red	5550 7270
21	Film, filter, green	5550 7280
22	Hook, cue lever	5530 5300
23	PCB ass'y, normal gate	6080 0550
24	Cue lever ass'y	6014 0530
S201	Switch, power	5044 4510
CR201, 202	Spark killer, 0.033uF+120Ω/400WV	5052 9050

PARTS LIST
Control unit ass'y
REV. 1

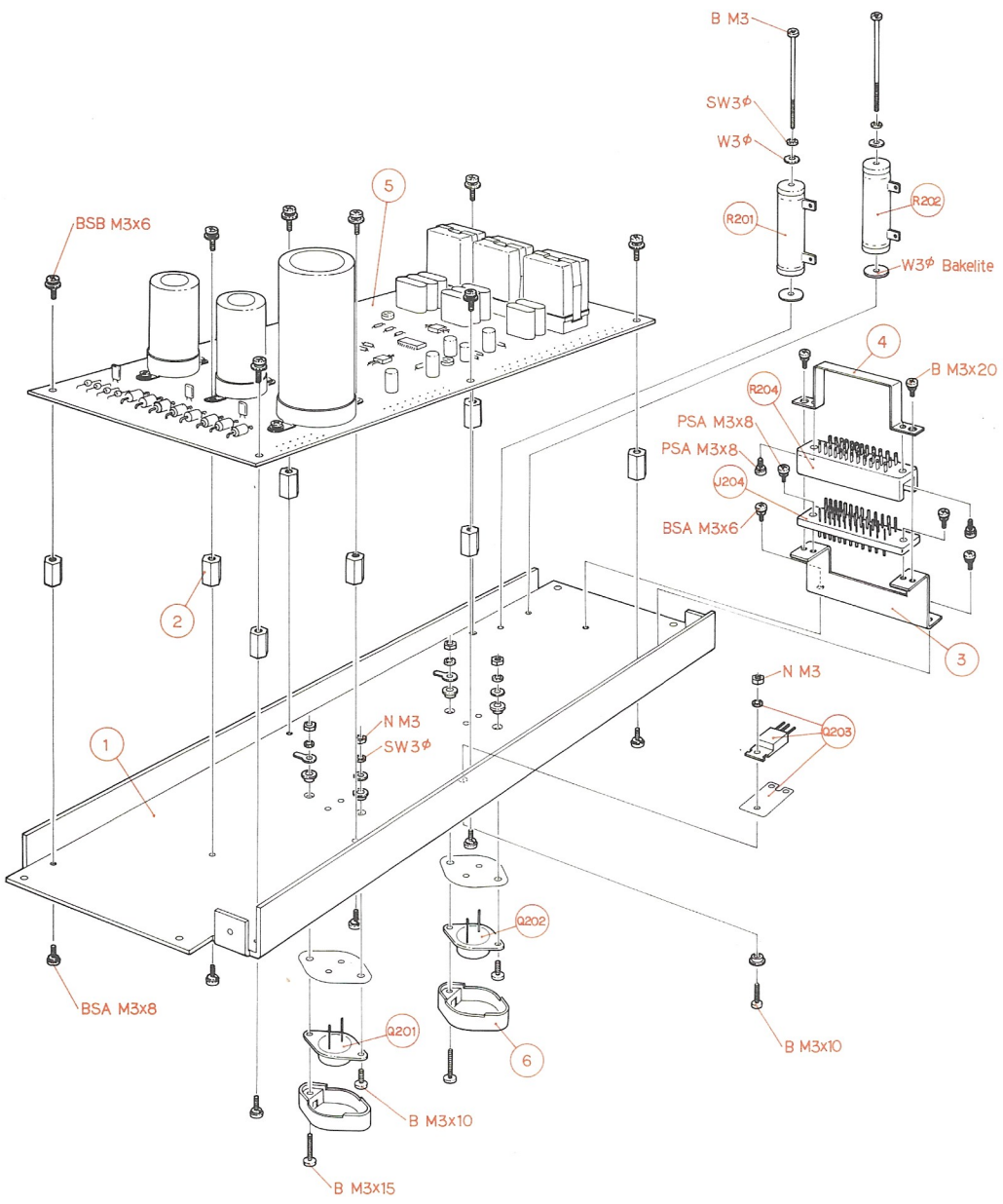
6.10 Record/reproduce amplifier assembly



Title	Record/Reproduce Amplifier Ass'y	Assembly No. 6085 2580
Ref. No.	Description	Parts No.
01	Chassis, amplifier	6037 2310
02	Guide, PCB	6045 0100
03	Connector board ass'y (See p. 74)	6085 2520
04	PCB, rec/repro amplifier ass'y (See p. 75)	6085 2530
05	Panel, amplifier	6036 1640
06	Escutcheon, meter	6014 4920
07	(deleted)	
08	Knob, line-in control, B-20B	5025 3750
09	Hinge	6014 4970
10	Plate, hinge	6014 4900
11	(deleted)	
12	Cushion, meter	6014 4840
13	Chassis, meter	6037 3441
14	PCB, peak indicator (See p. 82)	6085 2540
15	Cushion, lamp	5083 4240
16	Plate, sliding	6014 5940
17	Spacer (A)	6014 5950
18	Spacer (B)	6014 5960
19	Bar, PCB locking	6014 6010
20	Harness cable, meter circuit	6049 5850
21	" " , peak indicator	6049 2340-01
22	" " , mother board	6049 2340-00
R101∿108	Potentiometer, rotary, 10KΩ, taper A	6042 0050
M1∿8	Meter, VU	6055 0210
J1∿8	Connector, PCB, M44-18-10-139M	6052 1730
J10	" , " , PHC6-15S-2.5E	6052 1630
J12	" , 7P, S-I 7302	6052 1680
J 9	Receptacle (3 pin), 48-0008, SMK	6052 1720

PARTS LIST
Rec/repro amp. ass'y
REV. _____

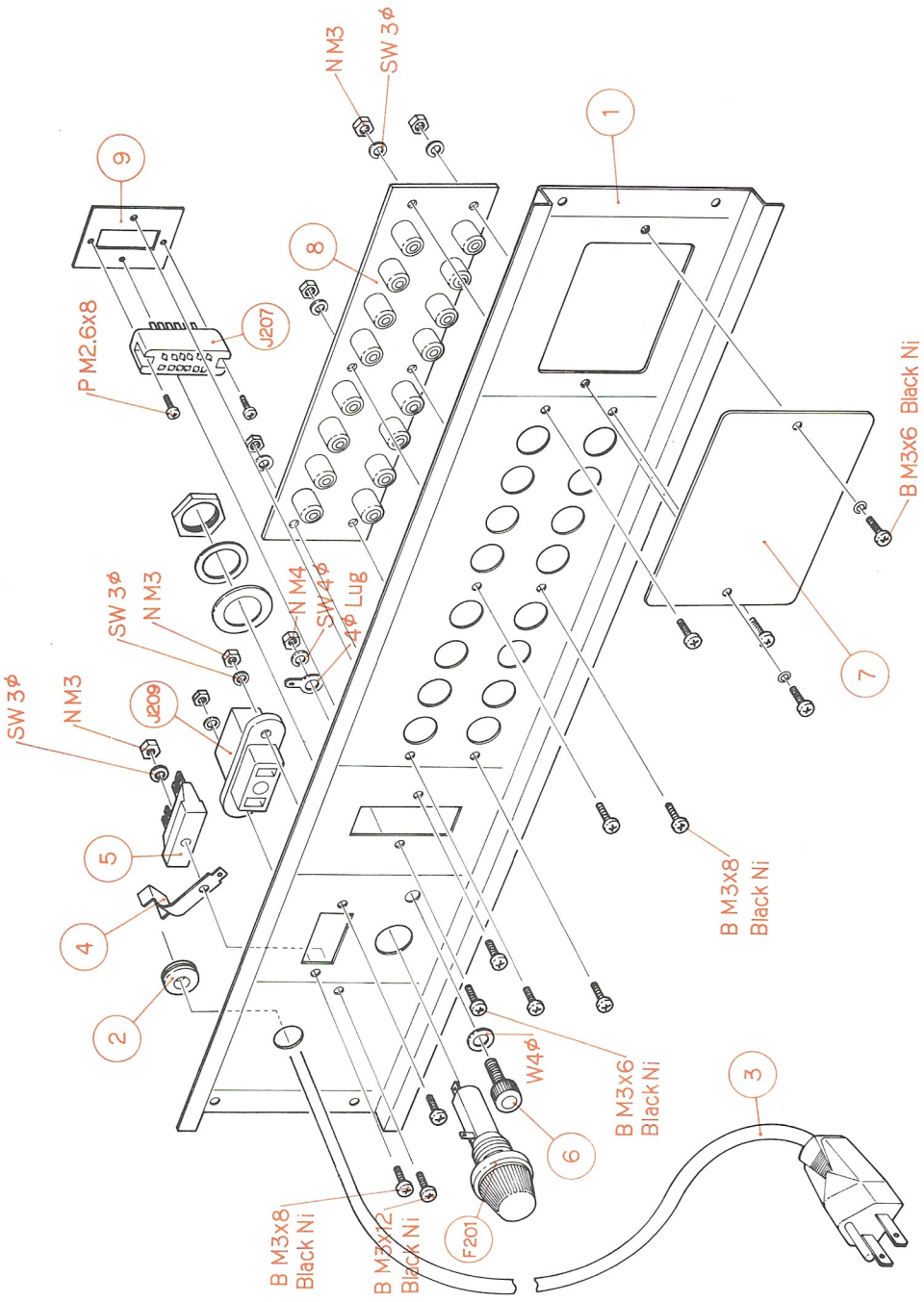
6.11 Power supply unit



Title	Power Supply Unit	Assembly No. 6080 0290
Ref. No.	Description	Parts No.
01	Chassis, power supply	6037 2340
02	Standoff, PCB	6004 8870
03	Bracket, connector	6014 4940
04	Handle, connector	5028 7490
05	PCB ass'y, power supply and reel motor control (See p. 83)	6080 0280
06	Insulating cover, transistor	6053 0150
Q201, 202	Transistor, 2SD-111	6048 0700
Q203	" , 2SD-234 (D)	6048 0680
R201, 202	Resistor, wirewound, 1 ohm, 15H	6040 2180
J204	Connector, multi, 34P receptacle, male, Hirose P-1334	5043 6390
P204	" , " , 34P plug, female, Hirose S-1334	5043 8200

PARTS LIST
Power supply unit
REV. _____

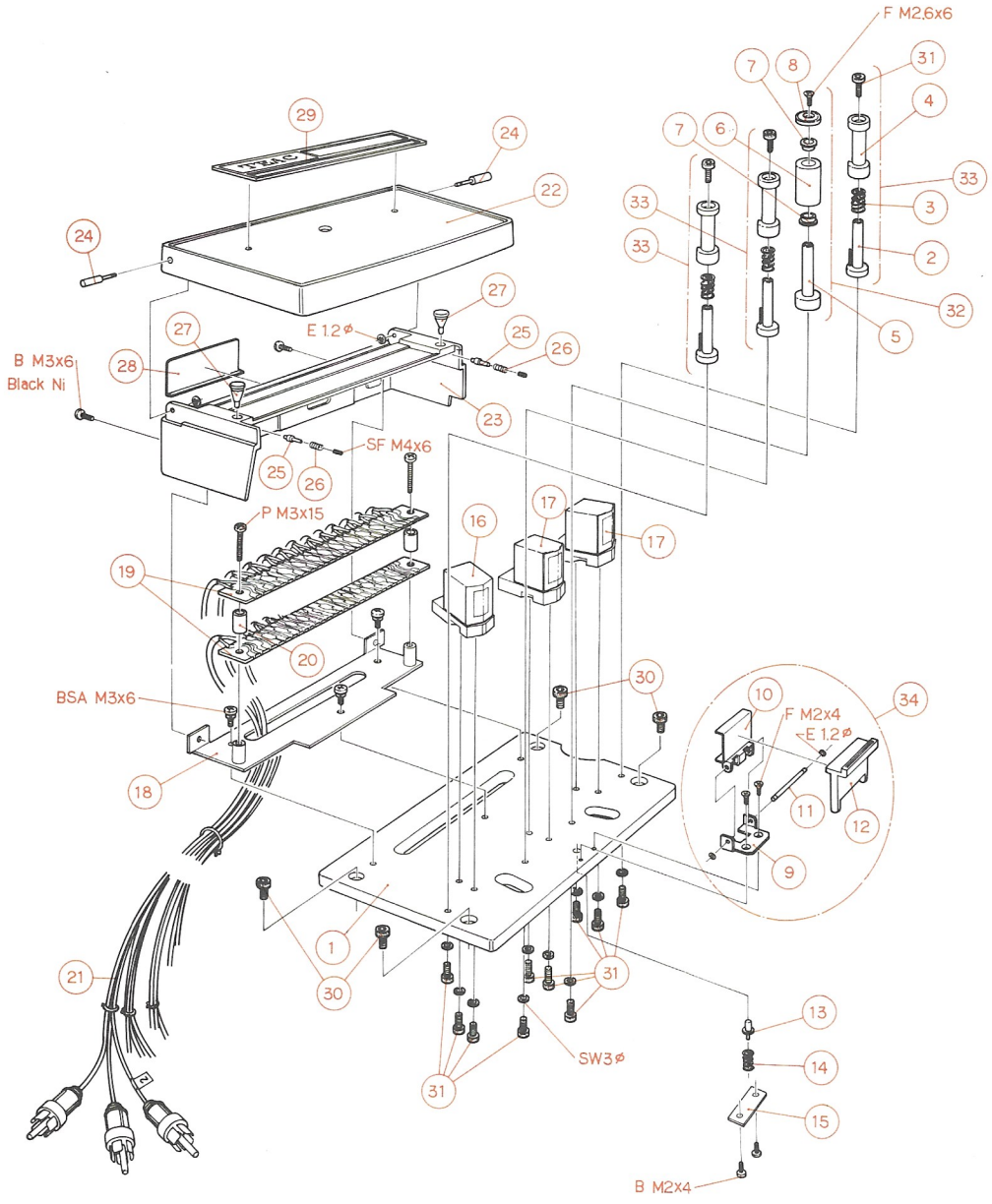
6.12 Rear panel assembly



Title	Rear Panel Assembly	Assembly No. 6085 2550
Ref. No.	Description	Parts No.
01	Panel, rear	6037 2300
02	Grommet, AC power cord	5032 3011
03	Cord, AC power cord	6049 0960
04	Clamp, AC power cord	6037 2200
05	Terminal strip, 2P	5043 8350
06	Terminal, grounding	5045 4071
07	Plate, hole cover	6014 4850
08	Pin jack strip, 16 jack	6052 1740
09	Bracket, receptacle mount	6014 4910
F 201	Holder, fuse	5041 2280
J 207	Receptacle, 12P	5043 8410
J 209	Outlet, AC	6052 0080

PARTS LIST
Rear panel ass'y
REV. _____

6.13 Head assembly/head housing assembly



Title	Head Assembly Head Housing Assembly (Ref. No. 22 ∿ 28)	Assembly No. 6013 0180 " " 6013 0170

Ref. No.	Description	Parts No.
01	Plate, housing base	6013 2380
02	Shaft, tape guide	6013 2400
03	Spring, tape guide	6004 0360
04	Tape guide	6013 2390
05	Shaft, scrape flutter roller	6013 2420
06	Roller, scrape flutter	6013 2410
07	Bearing, ball (LF-740ZZ)	6004 6650
08	Cap, scrape flutter roller	6013 2410
09	Base, magnetic shield	6013 2460
10	Plate, magnetic shield	6013 2470
11	Shaft, magnetic shield	6013 2500
12	Lever, magnetic shield	6013 2690
13	Pin, lock, magnetic shield	6013 2510
14	Spring, lock pin	6004 0380
15	Plate, spring retaining	6013 2530
16	Head, 8 track erase	5064 0820
17	Head, 8 track rec/repro.	5064 0810
18	Bracket, PCB mount	6013 2370
19	PCB, head wiring	6050 2691
20	Spacer, tubular	6004 8080
21	Cable ass'y, pin plug	6049 1080
22	Housing A, head	6013 2450
23	Housing B, head	5533 0020
24	Shaft, head housing	6013 2520
25	Pin, lock, head housing	5534 0120
26	Spring, lock pin	5520 2260
27	Cushion, rubber	5530 5390
28	Plate, hole cover	6013 2440
29	Plate, TEAC name	6007 1240
30	Screw, hex head, M4X6	5021 7190
31	" , " " , M3X6	5021 7160

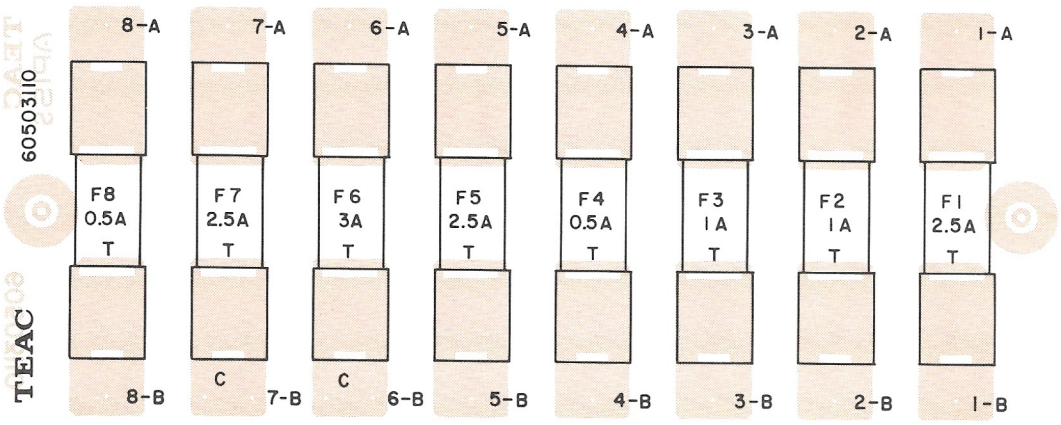
PARTS LIST
Head ass'y
Head housing ass'y
REV. 1

Ref. No.	Description	Parts No.
32	Scrape flutter roller assembly	6013 0240
33	Tape guide assembly	6013 0200
34	Shield cover assembly	6013 0210

PARTS LIST
Head ass'y
Head housing ass'y
REV. 1

7. PC CARDS AND PARTS LIST

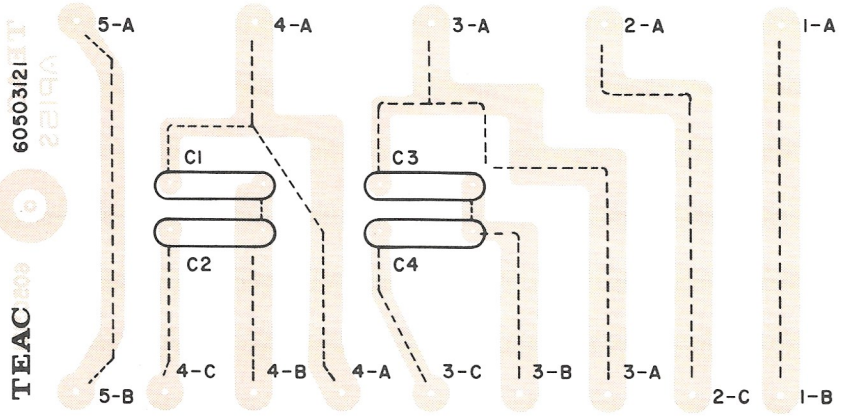
7.1 Fuse PCB assembly



Title	Fuse PCB Assembly	Assembly No. 6080 0300
Ref. No.	Description	Parts No.
1	PCB, fuse holder	6050 3110
F 1, 5, 7	Fuse, slow blow, 2.5A	6046 9010-03
F 2, 3	" , " " , 1A	6046 9010-01
F 4, 8	" , " " , 0.5A	6046 9010-00
F 6	" , " " , 3A	6046 9010-04
	Fuse holder, S-N5054	6052 9020

PARTS LIST, PC CARD
Fuse PCB Assembly
REV. _____

7.2 Terminal PCB assembly

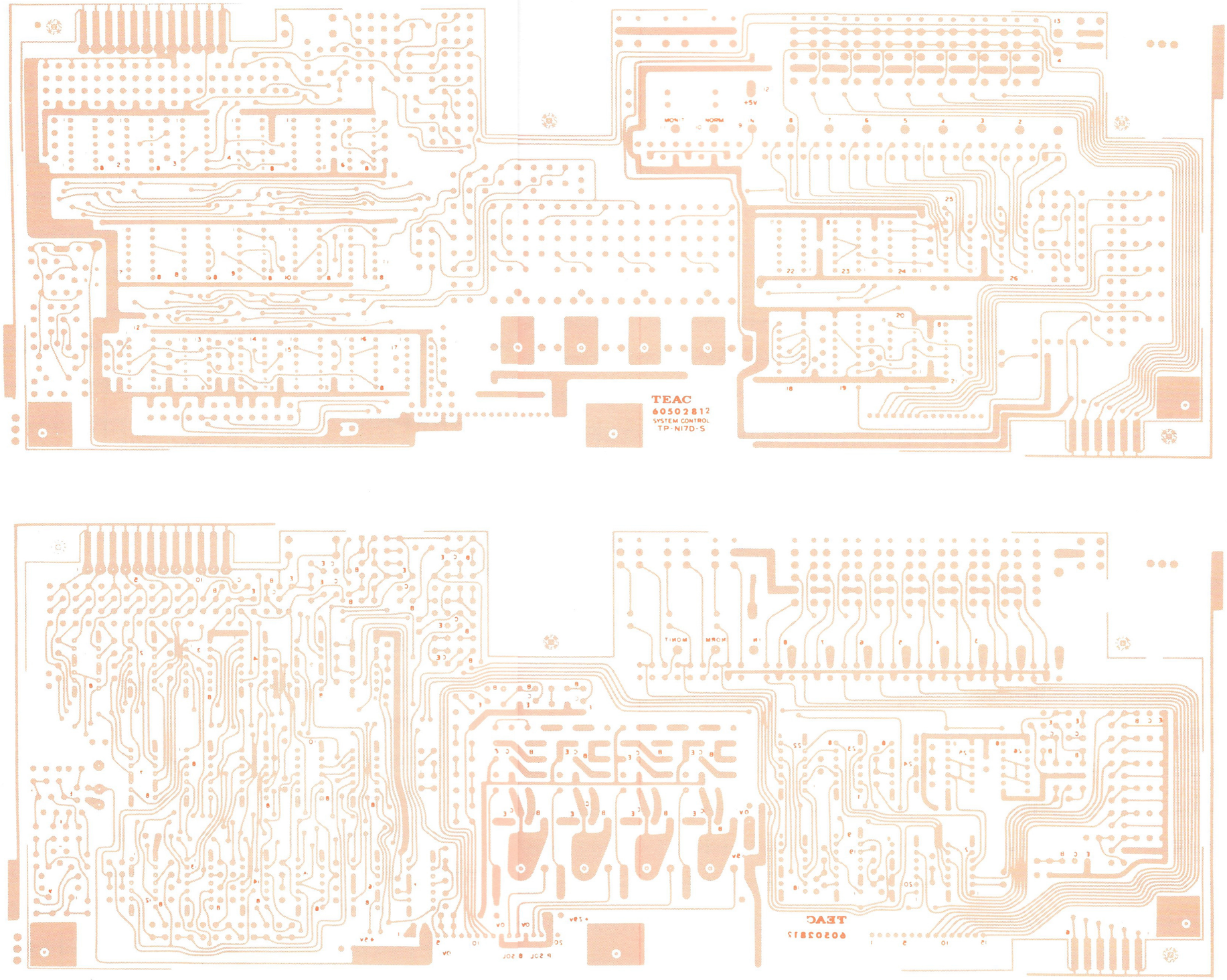


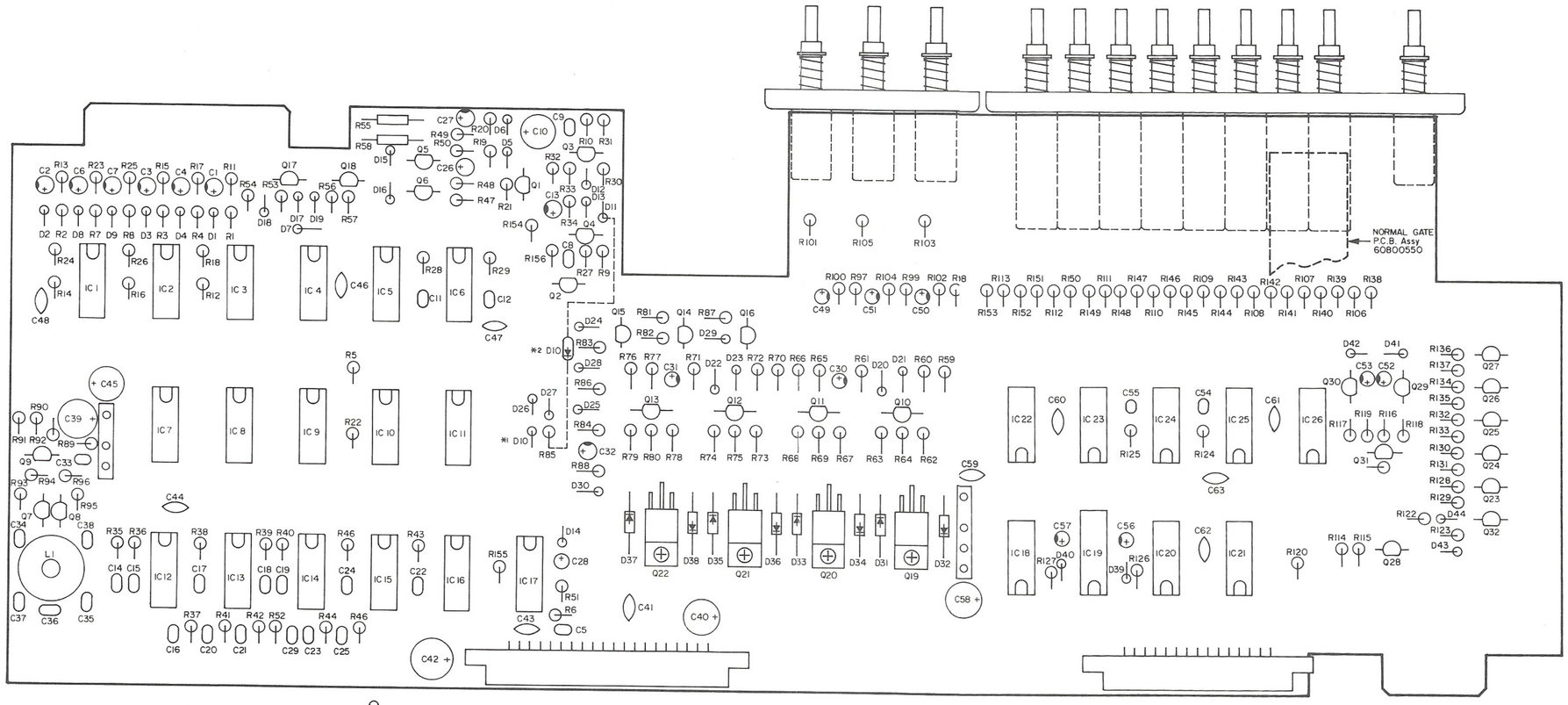
Title	Terminal PCB assembly	Assembly No. 6080 0420
Ref. No.	Description	Parts No.
1	PCB, terminal assembly	6050 3121
C 1~4	Capacitor, ceramic, 500V, 0.01uF	5054 2230
	Wire, terminal PCB	6049 1210

PARTS LIST, PC CARD
Terminal PCB assembly
REV. _____

7.3 System Control PCB Assembly

(Pattern No. 6050 2812 applicable to Model 80-8's up to Serial No. 8080971)





NOTES. 1. DIODE = = IS953

*1 D10 P.C.B. 60502812 ONLY.
*2 D10 P.C.B. 60502811 ONLY. (FOIL SIDE MOUNTING)

2. CAPACITOR
- MYLAR CAPACITOR
- CERAMIC CAPACITOR
- DIP. TANT. CAPACITOR
- ELEC. CAPACITOR

3. TRANSISTOR
- 2SC1312
- 2SC1211

E–C–B
(TOP VIEW)

This list applies to Model 80-8's with serial number up to 8080971.

Title	System Control PCB Assembly	Assembly No. 6080 0270
Ref. No.	Description	Parts No.
	PCB, System control	6050 2812
	Switch, push, 3 button, Alps	6051 0650
	" , " , 9 button, "	6051 0640
	Socket, IC (14P), A-4497-14, Showa Molex	6052 1790
	" , IC (16P), A-4497-16, " "	6052 1800
IC 1∿3	Integrated circuit, SN7400N	6048 9000
IC 4	" " , SN7404N	6048 9040
IC 5, 6	" " , SN7400N	6048 9000
IC 7	" " , SN7404N	6048 9040
IC 8	" " , SN7400N	6048 9000
IC 9, 10	" " , SN7408N	6048 9080
IC11	" " , SN7404N	6048 9040
IC12, 13	" " , SN7410N	6048 9100
IC14	" " , SN7400N	6048 9000
IC15	" " , SN7420N	6048 9110
IC16	" " , SN7400N	6048 9000
IC17	" " , SN74122N	6048 9140
IC18	" " , SN7410N	6048 9100
IC19	" " , SN74123N	6048 9150
IC20	" " , SN7400N	6048 9000
IC21, 22	" " , SN7404N	6048 9040
IC23∿26	" " , SN7400N	6048 9000
Q 1∿16	Transistor, 2SC1312Y-G	6048 0450
Q17, 18	" , 2SC1211D	6048 0080
Q19∿22	" , 2SB524D	6048 0490
Q23∿32	" , 2SC1312Y-G	6048 0450
D 1∿30	Diode, 1S953	5042 2720
D31∿38	" , 1N4002	6048 3270
D39∿44	" , 1S953	5042 2720
L 1	Transformer, oscillator	6046 6070
J202	Connector (20P), PCN6-20-PA-2.5DS, Hirose	6052 1650
J203	" (15P), PCN6-15-PA-2.5DS, "	6052 1640

PARTS LIST, PC CARD
System control PCB ass'y
REV. _____

Ref. No.	Description	Parts No.
J205	Connector, PC mtg., 4 pin male, 48-0009, SMK	6052 1700
J211	" , " , 3 " " , 48-0008, "	6052 1720
R 1∿4	Resistor, carbon, 1KΩ	
R 5	" , " , 220Ω	
R 6	" , " , 330Ω	
R 7∿18	" , " , 1KΩ	
R19	" , " , 22KΩ	
R20	" , " , 150KΩ	
R21	" , " , 4.7KΩ	
R22∿26	" , " , 1KΩ	
R27	" , " , 4.7KΩ	
R28, 29	" , " , 180Ω	
R30	" , " , 1KΩ	
R31	" , " , 100KΩ	
R32	" , " , 220KΩ	
R33, 34	" , " , 47KΩ	
R35∿46	" , " , 180Ω	
R47	" , " , 1KΩ	
R48, 49	" , " , 220KΩ	
R50	" , " , 1KΩ	
R51	" , " , 33KΩ	
R52	" , " , 180Ω	
R53	" , " , 1.2KΩ	
R54	" , " , 10KΩ	
R55	" , " , 330Ω, 1/2W, ±5%	
R56	" , " , 1.2KΩ	
R57	" , " , 10KΩ	
R58	" , " , 330Ω, 1/2W, ±5%	
R59	" , " , 47KΩ	
R60	" , " , 120KΩ	
R61	" , " , 33Ω	
R62	" , " , 1.2KΩ	
R63	" , " , 2.2KΩ	
R64	" , " , 4.7KΩ	
R65	" , " ,180KΩ	

All resistors $\frac{1}{4}$W, ±5% unless otherwise specified.

PARTS LIST, PC CARD
System control PCB ass'y
REV. _____

Ref. No.	Description	Parts No.
R66	Resistor, carbon, 470KΩ	
R67, 68	" , " , 2.2KΩ	
R69	" , " , 4.7KΩ	
R70	" , " , 68KΩ	
R71	" , " , 33Ω	
R72	" , " , 680KΩ	
R73, 74	" , " , 2.2KΩ	
R75	" , " , 4.7KΩ	
R76	" , " , 220KΩ	
R77	" , " , 470KΩ	
R78	" , " , 3.9KΩ	
R79	" , " , 2.2KΩ	
R80	" , " , 4.7KΩ	
R81	" , " , 10KΩ	
R82	" , " , 100KΩ	
R83∿85	" , " , 10KΩ	
R86, 87	" , " , 100KΩ	
R88	" , " , 33Ω	
R89	" , " , 10Ω	
R90	" , " , 8.2KΩ	
R91	" , " , 12KΩ	
R92	" , " , 390Ω	
R93	" , " , 1KΩ	
R94	" , " , 68Ω	
R95	" , " , 47KΩ	
R96	" , " , 68Ω	
R97∿99	" , " , 180Ω	
R100	" , " , 4.7KΩ	
R101	" , " , 100Ω	
R102	" , " , 4.7KΩ	
R103	" , " , 100Ω	
R104	" , " , 4.7KΩ	
R105	" , " , 100Ω	
R106∿108	" , " , 1KΩ	
R109∿113	" , " , 100Ω	

All resistors ¼W, ±5% unless otherwise specified.

PARTS LIST, PC CARD
System control PCB ass'y
REV. _____

Ref. No.	Description	Parts No.
R114	Resistor, carbon, 18KΩ	
R115	" , " , 100KΩ	
R116	" , " , 1KΩ	
R117, 118	" , " , 220KΩ	
R119	" , " , 1KΩ	
R120	" , " , 18KΩ	
R121	" , " , 100KΩ	
R122	" , " , 18KΩ	
R123	" , " , 100KΩ	
R124, 125	" , " , 180Ω	
R126, 127	" , " , 33KΩ	
R128	" , " , 18KΩ	
R129	" , " , 100KΩ	
R130	" , " , 18KΩ	
R131	" , " , 100KΩ	
R132	" , " , 18KΩ	
R133	" , " , 100KΩ	
R134	" , " , 18KΩ	
R135	" , " , 100KΩ	
R136	" , " , 18KΩ	
R137	" , " , 100KΩ	
R138	" , " , 180Ω	
R139	" , " , 100Ω	
R140	" , " , 180Ω	
R141	" , " , 100Ω	
R142	" , " , 180Ω	
R143	" , " , 100Ω	
R144	" , " , 180Ω	
R145	" , " , 100Ω	
R146	" , " , 180Ω	
R147	" , " , 100Ω	
R148	" , " , 180Ω	
R149	" , " , 100Ω	
R150	" , " , 180Ω	
R151	" , " , 100Ω	

All resistors $\frac{1}{4}$W, ±5% unless otherwise specified.

PARTS LIST, PC CARD
System control PCB ass'y
REV. _____

Ref. No.	Description	Parts No.
R152	Resistor, carbon, 180Ω	
R153	" , " , 100Ω	
R154	" , " , 220KΩ	
R155	" , " , 1KΩ	
R156	" , " , 220KΩ	
C 1∿4	Capacitor, dipped Tantalum, 25V, 1uF	6043 1700
C 5	" , Mylar, 50V, 0.01uF	6044 5370
C 6, 7	" , dipped Tantalum, 25V, 1uF	6043 1700
C 8, 9	" , Mylar, 50V, 0.01uF	6044 5370
C10	" , electrolytic, 10V, 47uF	6043 0180
C11, 12	" , Mylar, 50V, 0.022uF	6044 5390
C13	" , dipped Tantalum, 10V, 4.7uF	6043 1900
C14∿25	" , Mylar, 50V, 0.0068uF	6044 5210
C26, 27	" , dipped Tantalum, 16V, 2.2uF	6043 1710
C28	" , " , 6.3V, 47uF	6043 1920
C29	" , Mylar, 50V, 0.022uF	6044 5390
C30	" , dipped Tantalum, 10V, 10uF	6043 1750
C31	" , " , 16V, 2.2uF	6043 1710
C32	" , " , 10V, 33uF	6043 1740
C33	" , Mylar, 50V, 0.047uF	6044 5410
C34, 35	" , " , " , 0.01uF	6044 5370
C36	" , " , " , 0.047uF	6044 5410
C37	" , " , " , 0.01uF	6044 5370
C38	" , " , " , 0.033uF	6044 5400
C39	" , electrolytic, 10V, 100uF	5055 4570
C40	" , " , 50V, 47uF	5055 4580
C41	" , ceramic, 50V, 0.01uF	6044 0050
C42	" , electrolytic, 16V, 100uF	5055 4200
C43, 44	" , ceramic, 50V, 0.01uF	6044 0050
C45	" , electrolytic, 16V, 100uF	5055 4200
C46∿48	" , ceramic, 50V, 0.01uF	6044 0050
C49∿51	" , dipped Tantalum, 10V, 3.3uF	6043 1970
C52, 53	" , " , 16V, 2.2uF	6043 1710
C54, 55	" , Mylar, 50V, 0.022uF	6044 5390

All resistors ¼W, ±5% unless otherwise specified.

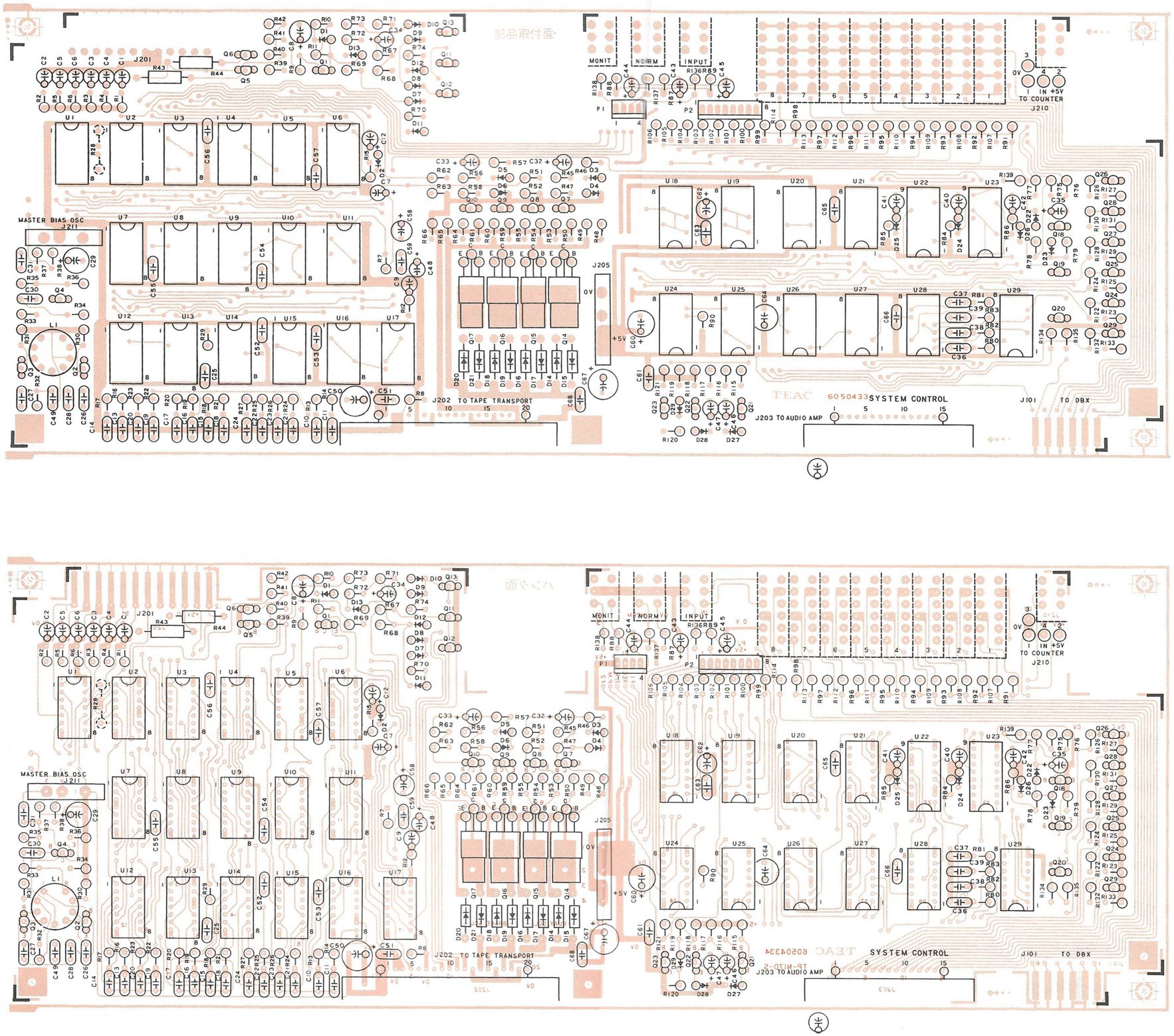
PARTS LIST, PC CARD
System control PCB ass'y
REV. _____

Ref. No.	Description	Parts No.
C56	Capacitor, dipped Tantalum, 10V, 10uF	6043 1750
C57	" , " , " , 22uF	6043 1910
C58	" , electrolytic, 16V, 100uF	5055 4200
C59∿63	" , ceramic, 50V, 0.01uF	6044 0050

PARTS LIST, PC CARD
System control PCB ass'y
REV. _____

7.3A System Control PCB Assembly

(Pattern No. 6050 4334 applicable to Model 80-8's from Serial No. 8080972 and later)



This list applies to Model 80-8's with serial No. 8080972 and later.

Title	System Control PCB Assembly	Assembly No. 6080 0270
Ref. No.	Description	Parts No.
	PCB, system control	6050 4334
	Switch, push, 3 button, Alps Co.	6051 0652
	" , " , 9 button, "	6051 0641
	Socket, IC (14P), A-4497-14, Showa Molex Co.	6052 1790
	" , IC (16P), A-4497-16,	6052 1800
U1	Integrated circuit, SN7414N	6048 9190
U2, 3	" " , SN7400N	6048 9000
U4	" " , SN7402N	6048 9020
U5	" " , SN7408N	6048 9080
U6	" " , SN74122N	6048 9140
U7	" " , SN7400N	6048 9000
U8, 9	" " , SN7404N	6048 9040
U10, 11	" " , SN7408N	6048 9080
U12	" " , SN7400N	6048 9000
U13	" " , SN7410N	6048 9100
U14	" " , SN7400N	6048 9000
U15	" " , SN7410N	6048 9100
U16	" " , SN7400N	6048 9000
U17	" " , SN7414N	6048 9190
U18, 19	" " , SN7400N	6048 9000
U20	" " , SN7410N	6048 9100
U21	" " , SN7410N	6048 9100
U22, 23	" " , SN74123N	6048 9150
U24	" " , SN7404N	6048 9040
U25, 26	" " , SN7400N	6048 9000
U27	" " , SN7404N	6048 9040
U28, 29	" " , SN7451N	6048 9300
Q1~4	Transistor, 2SC711A-F	6048 0850
Q5, 6	" , 2SC1211-D	6048 0080
Q7	" , 2SC1312Y-G	6048 0450

PARTS LIST
System control PCB assembly
REV. _____

Ref. No.	Description	Parts No.
Q8	Transistor, 2SC711A-F	6048 0850
Q9	" , 2SC1312Y-G	6048 0450
Q10, 11	" , 2SC711A-F	6048 0850
Q12, 13	" , 2SC1312Y-G	6048 0450
Q14	" , 2SB434-O	6048 0720
Q15	" , 2SB524-D	6048 0490
Q16	" , 2SB434-O	6048 0720
Q17	" , 2SB524-D	6048 0490
Q18∿29	" , 2SC711A-F	6048 0850
D1∿13	Diode, 1S953	5042 2720
D14∿21	" , 1N4002	6048 3270
D22∿29	" , 1S953	5042 2720
L1	Transformer, oscillator	6046 6070
J1	Connector, Mini-Konektcon, 5045A-04	6052 2260-04
J2	" , " , 5045A-08	6052 2260-08
J202	" , (20P), PCN6-20-PA-2.5DS, Hirose	6052 1650
J203	" , (15P), PCN6-15-PA-2.5DS, "	6052 1640
J205	" , PC mtg., 4 pin male, 48-0009, SMK	6052 1700
J211	" , " , 3 pin male, 48-0008, "	6052 1720
R1∿8	Resistor, carbon, 1KΩ	
R9	" , " , 4.7KΩ	
R10	" , " , 120KΩ	
R11	" , " , 150KΩ	
R12	" , " , 4.7KΩ	
R13, 14	" , " , 180Ω	
R15	" , " , 33KΩ	
R16∿27	" , " , 180Ω	
R28	" , " , 10Ω	
R29	" , " , 180Ω	
R30, 31	" , " , 68Ω	
R32	" , " , 47KΩ	
R33	" , " , 1KΩ	

All resistors ¼W, ±5% unless otherwise specified.

PARTS LIST
System control PCB assembly
REV. _____

Ref. No.	Description	Parts No.
R34	Resistor, carbon, 680Ω	
R35	" , " , 8.2KΩ	
R36	" , " , 12KΩ	
R37	" , " , 390Ω	
R38	" , " , 10Ω	
R39	" , " , 1.2KΩ	
R40	" , " , 10KΩ	
R41	" , " , 1.2KΩ	
R42	" , " , 10KΩ	
R43, 44	" , " , 330Ω, ½W, ±5%	
R45	" , " , 47KΩ	
R46	" , " , 33Ω	
R47	" , " , 120KΩ	
R48	" , " , 1.2KΩ	
R49	" , " , 2.2KΩ	
R50	" , " , 4.7KΩ	
R51	" , " , 180KΩ	
R52	" , " , 470KΩ	
R53, 54	" , " , 2.2KΩ	
R55	" , " , 4.7KΩ	
R56	" , " , 68KΩ	
R57	" , " , 33Ω	
R58	" , " , 680KΩ	
R59, 60	" , " , 2.2KΩ	
R61	" , " , 4,7KΩ	
R62	" , " , 180KΩ	
R63	" , " , 470KΩ	
R64	" , " , 3.9KΩ	
R65	" , " , 2.2KΩ	
R66	" , " , 4.7KΩ	
R67	" , " , 10KΩ	
R68	" , " , 100KΩ	
R69	" , " , 10KΩ	
R70	" , " , 100KΩ	

All resistors ¼W, ±5% unless otherwise specified.

Ref. No.	Description	Parts No.
R71	Resistor, carbon, 10KΩ	
R72	" , " , 33Ω	
R73	" , " , 10KΩ	
R74	" , " , 100KΩ	
R75	" , " , 1KΩ	
R76	" , " , 220KΩ	
R77	" , " , 1KΩ	
R78	" , " , 47KΩ	
R79	" , " , 220KΩ	
R80∿83	" , " , 180Ω	
R84, 85	" , " , 18KΩ	
R86	" , " , 27KΩ	
R87∿89	" , " , 4.7KΩ	
R90∿98	" , " , 1KΩ	
R99∿106	" , " , 180Ω	
R107∿114	" , " , 100Ω	
R115	" , " , 1KΩ	
R116, 117	" , " , 220KΩ	
R118	" , " , 1KΩ	
R119	" , " , 4.7KΩ	
R120	" , " , 47KΩ	
R121	" , " , 1KΩ	
R122	" , " , 4.7KΩ	
R123	" , " , 100KΩ	
R124	" , " , 4.7KΩ	
R125	" , " , 100KΩ	
R126	" , " , 4.7KΩ	
R127	" , " , 100KΩ	
R128	" , " , 4.7KΩ	
R129	" , " , 100KΩ	
R130	" , " , 4.7KΩ	
R131	" , " , 100KΩ	
R132	" , " , 4.7KΩ	
R133	" , " , 100KΩ	

All resistors $\frac{1}{4}$W, ±5% unless otherwise specified.

PARTS LIST
System control PCB assembly
REV. _____

Ref. No.	Description	Parts No.
R134	Resistors, carbon, 18KΩ	
R135	" , " , 100KΩ	
R136∿138	" , " , 180Ω	
R139	" , " , 100KΩ	
C1∿7	Capacitor, dipped Tantalum, 25V, 1uF	6043 1700
C8	" , " " , 6.3V, 47uF	6043 1920
C9	" , Mylar, 50V, 0.01uF	6044 5370
C10, 11	" , " , " , 0.022uF	6044 5390
C12	" , dipped Tantalum, 6.3V, 47uF	6043 1920
C13∿24	" , Mylar, 50V, 0.0068uF	6044 5210
C25	" , " , " , 0.022uF	6044 5390
C26, 27	" , Polystyrene, 50V, 0.01uF	6044 7830
C28	" , " , " , 0.047uF	6044 5410
C29	" , electrolytic, 16V, 100uF	5055 4570
C30	" , Mylar, 50V, 0.01uF	6044 5370
C31	" , " , " , 0.047uF	6044 5410
C32	" , dipped Tantalum, 10V, 4.7uF	6043 1900
C33	" , " " , 25V, 1uF	6043 1700
C34	" , " " , 10V, 22uF	6043 1910
C35	" , " " , " , 10uF	6043 1750
C36∿39	" , Mylar, 50V, 0.022uF	6044 5390
C40, 41	" , dipped Tantalum, 10V, 22uF	6043 1910
C42	" , " " , 6.3V, 47uF	6043 1920
C43∿45	" , " " , 10V, 3.3uF	6043 1970
C46, 47	" , " " , 16V, 2.2uF	6043 1710
C48	" , " " , 25V, 1uF	6043 1700
C49	" , Mylar, 50V, 0.033uF	6044 5400
C50	" , electrolutic, 16V, 100uF	5055 4200
C51∿57	" , ceramic, 50V, 0.01uF	6044 0050
C58	" , electrolytic, 16V, 47uF	5055 4010
C59	" , ceramic, 50V, 0.01uF	6044 0050
C60	" , electrolytic, 16V, 47uF	5055 4010
C61	" , ceramic, 50V, 0.01uF	6044 0050

All resistors $\frac{1}{4}$W, ±5% unless otherwise specified

PARTS LIST
System control PCB assembly
REV. _____

Ref. No.	Description	Parts No.
C62	Capacitor, electrolytic, 16V, 47uF	5055 4010
C63	" , ceramic, 50V, 0.01uF	6044 0050
C64	" , electrolytic, 16V, 47uF	5055 4010
C65, 66	" , ceramic, 50V, 0.01uF	6044 0050
C67	" , electrolytic, 50V, 47uF	5055 4580
C68	" , ceramic, 50V, 0.01uF	6044 0050

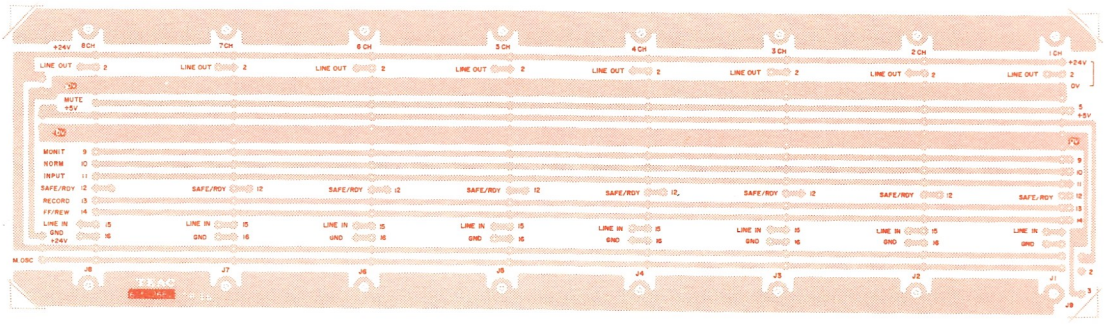
PARTS LIST
System control PCB assembly
REV. _____

7.4 LED indicator PCB assembly

Title	LED Indicator PCB Assembly	Assembly No. 6085 0310
Ref. No.	Description	Parts No.
1	PCB. LED indicator	6050 2830
D 1~11	LED, red, GD-4-203-SRG	5042 5110
	Harness, indicator lead	6049 1220

PARTS LIST, PC CARD
LED indicator PCB assembly
REV. _____

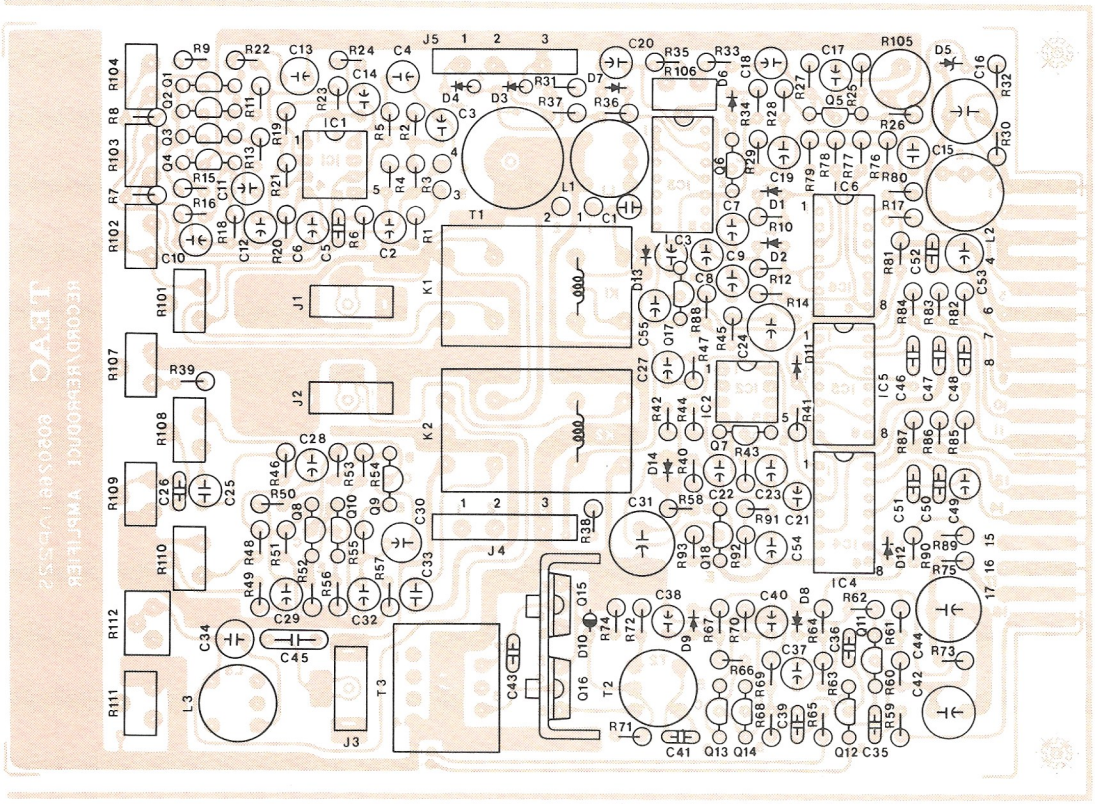
7.5 Connector board PCB assembly



Title	Connector Board PCB Assembly	Assembly No. 6085 2520
Ref. No.	Description	Parts No.
	PCB, connector board	6050 2682*
J1~J8	Receptacle, card-edge connector, Mitsumi M44-18-10-139M	6052 1730*
J9	Connector, SMK 48-0008	6052 1720*
	Harness, w/J10 connector	6049 5870
J10	Connector, Hirose PCN6-15S-2.5E	6052 1630
	Harness, w/J12 connector	6049 5860
J12	Connector (7P), SMK S-I7302	6052 1680
	Harness, wire, input/output, w/16 pin jack strip (6052 1740)	6049 5880
	Connector board, w/card-edge connector (Ass'y of * items above)	6085 2510

PARTS LIST, PC CARD
Connector board PCB
REV. 1

7.6 Record/reproduce amplifier PCB assembly



Title	Record/reproduce Amplifier PCB Assembly	Assembly No. 6085 2530
Ref. No.	Description	Parts No.
	Record/reproduce amplifier PCB	6050 2663
IC1∿2	Integrated circuit, RC4558DN	6048 6070
IC3, 5	" " , SN7400N	6048 9000
IC4	" " , SN7404N	6048 9040
IC6	" " , SN7426N	6048 9180
Q1∿4	Transistor, FET, 2N5462	6048 0710
Q5∿8	" , 2SC1312Y-G	6048 0450
Q9∿11	" , 2SC1211-D	6048 0080
Q12	" , FET, 2N5462	6048 0710
Q13	" , 2SC1312Y-G	6048 0450
Q14	" , 2SC1211-D	6048 0080
Q15, 16	" , 2SD361-D	6048 0560
Q17, 18	" , 2SC1312Y-G	6048 0450
D1, 2	Diode, 1S953	5042 2720
D3, 4	" , 1N60	5042 2130
D5	" , RD-11A	6048 3170
"	" , RD13EB (from serial #8080972)	5143 0590
D6∿9	" , 1S953	5042 2720
D10	" , Varistor, M-8513AR	6048 3450
D11, 12	" , 1N60	5042 2130
D13, 14	" , 1N4002	6048 3270
D15	" , 1S953 (from serial #8080222)	5042 2720
	Heat sink	6037 1660
T1	Transformer, step-up	6046 6211
T2	" , inter-stage, MC124	6046 6080
T3	" , output	6046 6182
K1, 2	Relay, 24V, LZ-2	6047 0100
L1∿3	Coil, trap	5056 6560
R101, 102	Pot, trim, SR29R, 6.8KΩ, taper B	6041 0160
R103, 104	" , " , " , 10KΩ, "	5053 3910
R105	" , " , SR19R, 22KΩ, "	5053 3560
R106, 107	" , " , SR29R, 22KΩ, "	5053 3920
R108	" , " , " , 3.3KΩ, "	6041 0150
R109	" , " , " , 470Ω, "	6041 0130
R110	" , " , " , 10KΩ, "	5053 3910

PARTS LIST, PC CARD
Rec/repro amp PCB ass'y
REV. 1

Ref. No.	Description	Parts No.
R111	Pot, trim, SR29R, 1KΩ, taper B	5053 3950
R112	" , " , PNB04C3A-503V, 50KΩ, taper B	6041 0071
J1∿3	Jack, pin, SMK S-Q3056	6052 0880
J4, 5	Plug, connector, PC mtg., SMK 48-0008	6052 1720
R 1	Resistor, carbon, 1KΩ	
R 2	" , " , 47KΩ	
R 3	" , " , 22KΩ	
R 4	" , " , 150KΩ	
R 5	" , " , 1KΩ	
R 6	" , " , 820KΩ	
R 7	" , " , 1.5KΩ	
R 8	" , " , 1.5KΩ	
R 9	" , " , 100KΩ	
R10	" , " , 100KΩ (220KΩ from serial #8080972)	
R11	" , " , 100KΩ	
R12	" , " , 150KΩ (220KΩ from serial #8080972)	
R13	" , " , 100KΩ	
R14	" , " , 100KΩ	
R15	" , " , 2.2KΩ	
R16	" , " , 100KΩ	
R17	" , " , 10KΩ	
R18	" , " , 39KΩ	
R19	" , " , 47KΩ	
R20	" , " , 47KΩ	
R21	" , " , 150KΩ	
R22	" , " , 1KΩ	
R23	" , " , 33KΩ	
R24	" , " , 680Ω	
R25	" , " , 180KΩ	
R26	" , " , 56KΩ	
R27	" , " , 2.2KΩ	
R28	" , " , 150Ω	
R29	" , " , 1KΩ	
R30	" , " , 220Ω	

All resistors ¼W, ±5% unless otherwise specified.

PARTS LIST, PC CARD
Rec/repro amp PCB ass'y
REV. 1

Ref. No.	Description	Parts No.
R31	Resistor, carbon, 2.2KΩ	
R32	" , " , 2.2KΩ	
R33	" , " , 27KΩ	
R34	" , " , 47KΩ	
R35	" , " , 1KΩ	
R36	" , " , 470Ω	
R37	" , " , 270Ω	
R38	" , " , 22KΩ	
R39	" , " , 82KΩ	
R40	" , " , 1KΩ	
R41	" , " , 33KΩ	
R42	" , " , 47KΩ	
R43	" , " , 47KΩ	
R44	" , " , 100KΩ	
R45	" , " , 3.3KΩ	
R46	" , " , 3.3KΩ	
R47	" , " , 47KΩ	
R48	" , " , 1KΩ	
R49	" , " , 1KΩ	
R50	" , " , 220KΩ	
R51	" , " , 33KΩ	
R52	" , " , 3.3KΩ	
R53	" , " , 39KΩ	
R54	" , " , 390KΩ	
R55	" , " , 100Ω	
R56	" , " , 100Ω	
R57	" , " , 10KΩ	
R58	" , " , 100Ω	
R59	" , " , 1KΩ	
R60	" , " , 56KΩ	
R61	" , " , 12KΩ	
R62	" , " , 470Ω	
R63	" , " , 10KΩ	
R64	" , " , 4.7KΩ	
R65	" , " , 100Ω	

All resistors $\frac{1}{4}$W, ±5% unless otherwise specified.

PARTS LIST, PC CARD
Rec/repro amp PCB ass'y
REV. _____

Ref. No.	Description	Parts No.
R66	Resistor, carbon, 22KΩ	
R67	" , " , 100KΩ (56KΩ from serial #8080822)	
R68	" , " , 27KΩ	
R69	" , " , 2.2KΩ	
R70	" , " , 150Ω	
R71	" , " , 4.7KΩ	
R72	(deleted)	
R73	" , " , 390Ω	
R74	" , " , 10Ω	
R75	" , " , 10Ω	
R76	" , " , 6.8KΩ	
R77	" , " , 12KΩ	
R78	" , " , 12KΩ } (8.2KΩ from serial #8080972)	
R79	" , " , 12KΩ }	
R80	" , " , 12KΩ	
R81~87	" , " , 4.7KΩ	
R88	" , " , 33KΩ	
R89	" , " , 4.7KΩ	
R90	" , " , 2.2KΩ	
R91	" , " , 3.9KΩ	
R92	" , " , 6.8KΩ	
R93	" , " , 100KΩ	
C 1	Capacitor, Polystyrene, 50V, 1000pF	6043 5340
C 2	" , electrolytic, 16V, 10uF*	6043 1770
C 3, 4	" , " , " , "	5055 4050
C 5	" , Mylar, 50V, 0.012uF	6044 7330
C 6	" , electrolytic, 16V, 10uF	5055 4050
C 7, 8	" , " , 25V, 2.2uF	5055 4940
C 9, 10	" , " , " , 0.47uF	5055 4430
C11	" , " , 50V, 2.2uF*	6043 1780
C12	" , " , 16V, 10uF	5055 4050
C13	" , " , " , 22uF	5055 4880
C14	" , " , " , 10uF*	6043 1770
C15	" , Polystyrene, 50V, 1000pF	6043 5340

All resistors ¼W, ±5% unless otherwise specified.
* = Indicates low leakage capacitors.

PARTS LIST, PC CARD
Rec/repro amp PCB ass'y
REV. 1

Ref. No.	Description	Parts No.
C16	Capacitor, electrolytic, 25V, 100uF	5055 4170
C17	" , " , 16V, 10uF	5055 4050
C18	" , " , 25V, 2.2uF	5055 4940
C19	" , " , 6.3V, 47uF	5055 4030
C20	" , " , 25V, 4.7uF	5055 4530
C21	" , " , 25V, 2.2uF	5055 4940
C22	" , " , 50V, 2.2uF*	6043 1780
C23	" , " , 16V, 10uF	5055 4050
C24	" , " , " , 47uF	5055 4010
C25	" , Polystyrene, 50V, 330pF	6043 5520
C26	" , Mylar, 50V, 0.0033uF	6044 5190
C27	" , Dipped Tantalum, 35V, 0.47uF	6043 1960
C28, 29	" , electrolytic, 16V, 10uF	5055 4050
C30	" , " , 6.3V, 47uF	5055 4030
C31	" , " , 25V, 100uF	5055 4170
C32	" , " , 16V, 10uF*	6043 1770
C33	" , Polystyrene, 50V, 820pF	6043 5020
C34	" , " , 25V, 1000pF	6044 7610
C35, 36	" , Mylar, 50V, 0.01uF	6044 5370
C37	" , solid Tantalum, 16V, 22uF	6043 2070
C38	" , " , " , 10uF	5055 4050
C39	" , Mylar, 50V, 0.01uF	6044 5370
C40	" , electrolytic, 25V, 1uF	5055 4670
"	" , solid Tantalum, 10V, 22uF (from serial #13001)	6043 1910
C41	" , Mylar, 50V, 0.047uF	6044 5410
"	" , Polypropylene, 50V, 0.047uF (from serial #14001)	6044 7910
C42	" , electrolytic, 25V, 47uF	5055 4020
C43	" , Mylar, 50V, 0.0027uF	6044 7290
"	" , Polypropylene, 50V, 0.0047uF (from serial #14001)	6044 7790
C44	" , electrolytic, 25V, 100uF	5055 4170
C45	" , Mylar, 250V, 0.022uF	6044 6550
"	" , Mylar, 160V, 0.01uF (from serial #8080922)	6044 6390
C46~48	" , " , 50V, 0.001uF	6044 5160
C49	" , electrolytic, 25V, 4.7uF	5055 4530
C50, 51	" , Mylar, 50V, 0.001uF	6044 5160
C52	" , " , " , 0.01uF	6044 5370

* = Indicates low leakage capacitors.

PARTS LIST, PC CARD
Rec/repro amp PCB ass'y
REV. 1

Ref. No.	Description	Parts No.
C53	" , electrolytic, 16V, 22uF	5055 4880
C54	" , solid Tantalum, 6.3V, 47uF	6043 1920
C55	" , " , 25V, 10uF	5055 4040
C56	" , " , 16V, 10uF	5055 4030

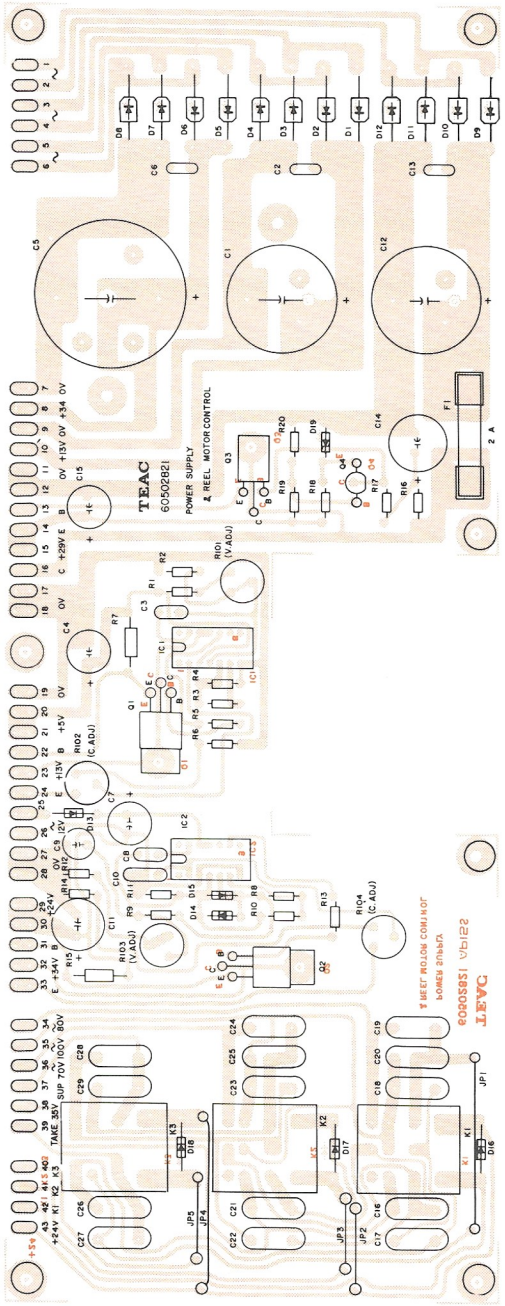
PARTS LIST, PC CARD
Rec/repro amp PCB ass'y
REV. _____

7.7 Peak indicator PCB assembly

Title	Peak Indicator PCB Assembly	Assembly No. 6085 2540
Ref. No.	Description	Parts No.
	PCB, peak indicator	6050 3080
D1∿D4	LED, Stanley GD-4 203SRG	5042 5110
PL1∿PL4	Lamp, sub-miniature incand., BQ041-23003A	6046 8080
	Grommet, lamp mount	5083 4240

PARTS LIST, PC CARD
Peak indicator PCB
REV. _____

7.8 Power supply and reel motor control PCB assembly



Title	Power Supply and Reel Motor Control PCB Ass'y	Assembly No. 6080 0280
Ref. No.	Description	Parts No.
	Power supply and reel motor control PCB	6050 2821
K 1, 2	Relay, w/PC mtg. socket, MY3PY-1-O, DC 24V	6047 0360
K 3	" , " " " , MY2PY-1-O, "	5061 0950
	Fuse holder, S-N5054	6052 9020
F 1	Fuse, glass tubular, 6φX30, 2A	5041 1140
IC 1, 2	Integrated circuit, uA723DC	6048 6060
Q 1, 2	Transistor, 2SD234-(O)	6048 0680
Q 3	" , 2SC495-(O)	6048 0690
Q 4	" , 2SC1312Y-G	6048 0450
D 1~12	Diode, P-300D4	6048 3290
D13	" , 1N4002	6048 3270
D14, 15	" , 1S953	5042 2720
D16~18	" , 1N4002	6048 3270
D19	" , Zener, RD-9A	6048 3350
R 1	Resistor, carbon, 750Ω	
R 2	" , " , 2.7KΩ	
R 3	" , " , 1KΩ	
R 4	" , " , 1.2KΩ	
R 5	" , " , 100Ω	
R 6	" , " , 47KΩ	
R 7	" , " , 100Ω, 1/2W, ±5%	
R 8~11	" , " , 3.3KΩ	
R12	" , " , 18KΩ	
R13	" , " , 100Ω	
R14	" , " , 47KΩ	
R15	" , " , 100Ω, 1/2W, ±5%	
R16	" , " , 1KΩ	
R17	" , " , 202Ω	
R18	" , " , 3.6KΩ	
R19	" , " , 4.7KΩ	
R20	" , " , 2.2KΩ	

All resistors $\frac{1}{4}$W, ±5% unless otherwise specified.

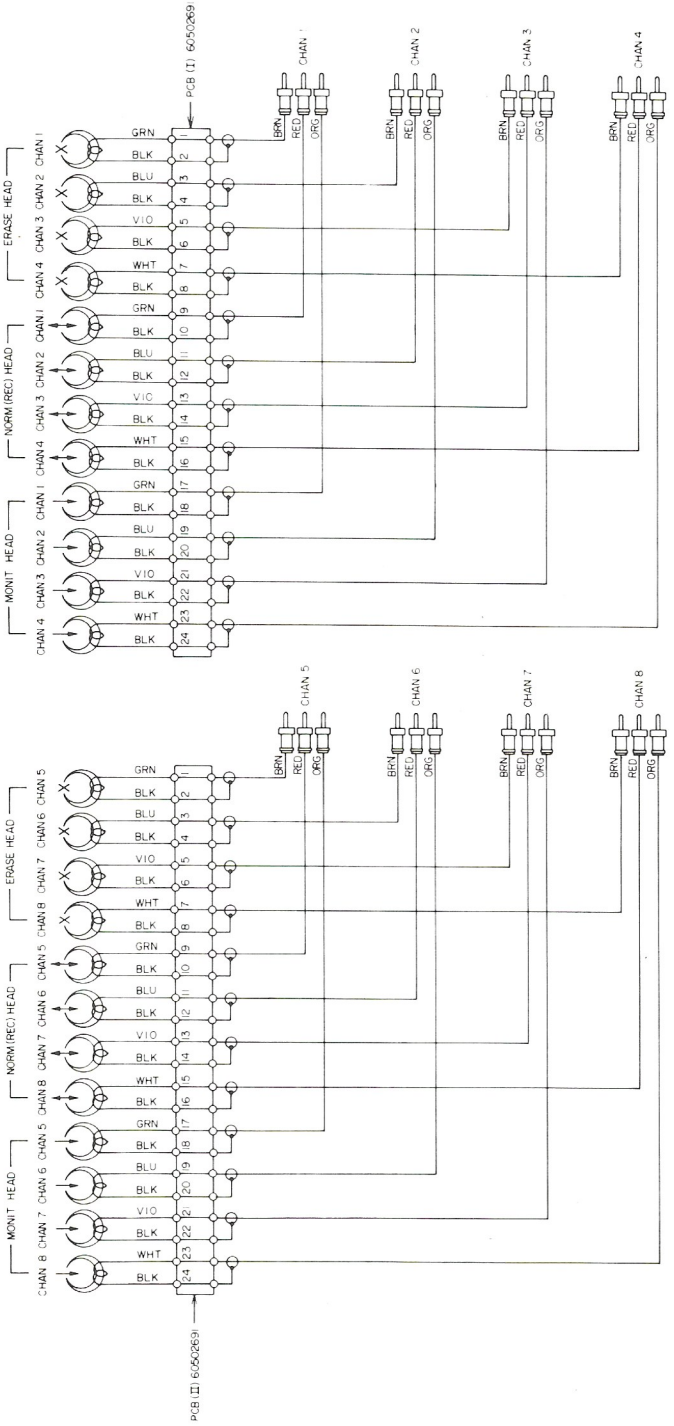
PARTS LIST, PC CARD
Pwr supp. & reel motor cont. PCB
REV. _____

Ref. No.	Description	Parts No.
C 1	Capacitor, electrolytic, 25V, 4700uF	6043 1930
C 2	" , ceramic, 500V, 0.01uF	5054 2230
C 3	" , Mylar, 50V, 0.01uF	6044 5370
C 4	" , electrolytic, 16V, 100uF	5055 4200
C 5	" , " , 63V, 4700uF	6043 1950
C 6	" , ceramic, 500V, 0.01uF	5054 2230
C 7	" , electrolytic, 25V, 100uF	5055 4170
C 8	" , Mylar, 50V, 0.047uF	6044 5410
C 9	" , electrolytic, 25V, 47uF	5055 4020
C10	" , Mylar, 50V, 0.1uF	6044 5550
C11	" , electrolytic, 35V, 100uF	5055 4630
C12	" , " , 50V, 2200uF	6043 1940
C13	" , ceramic, 500V, 0.01uF	5054 2230
C14	" , electrolytic, 50V, 100uF	5055 4070
C15	" , " , 50V, 47uF	5055 4580
C16∿29	" , metallized Mylar, 400WV, 0.1uF	5054 9920
R101	Potentiometer, 1KΩ, taper B	6041 0120-06
R102	" , 22KΩ, "	6041 0120-14
R103	" , 10KΩ, "	6041 0120-12
R104	" , 4.7KΩ, "	6041 0120-10

PARTS LIST, PC CARD
Pwr supp. & reel motor cont. PCB
REV. _____

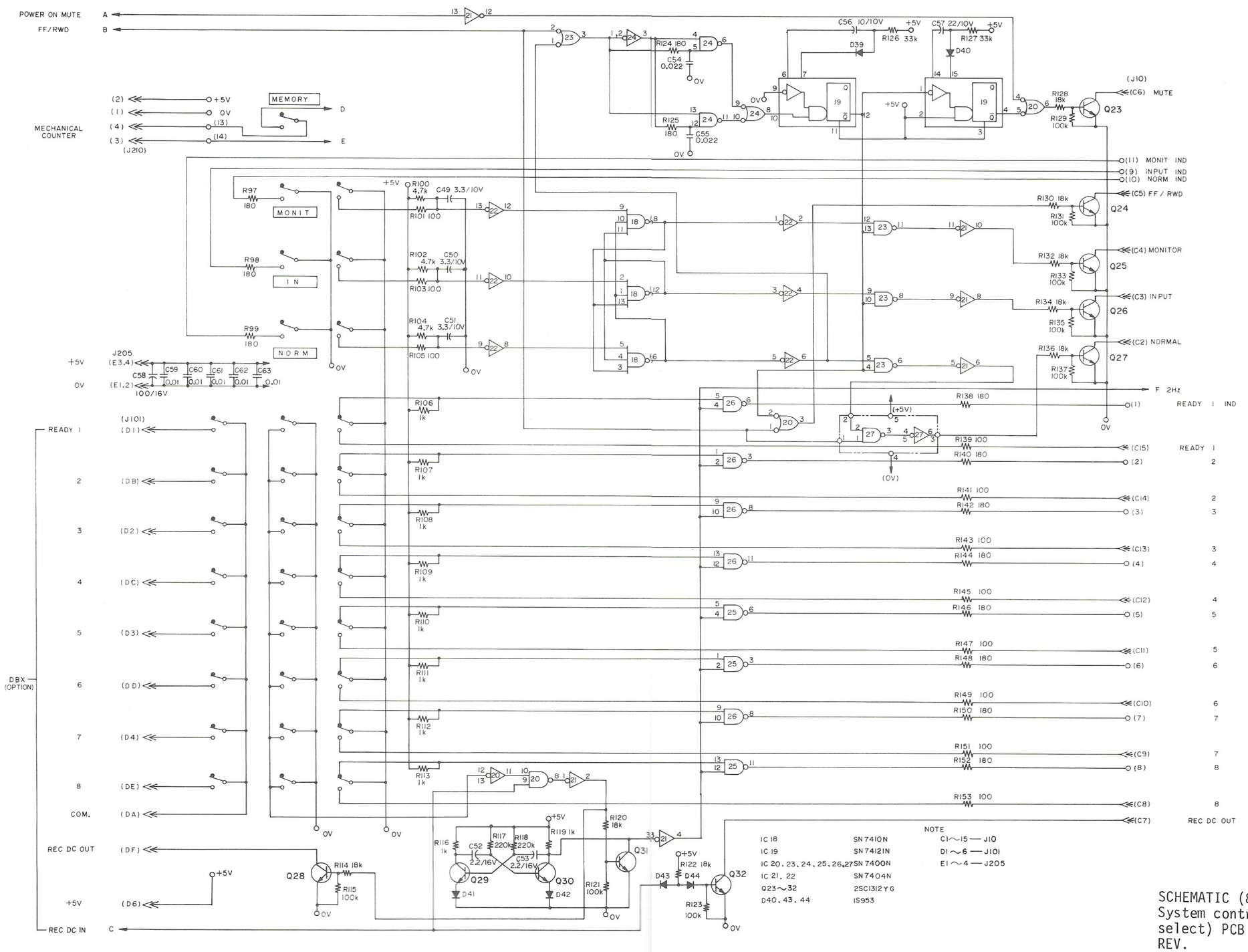
8. ELECTRONICS SCHEMATICS

8.1 Head assembly



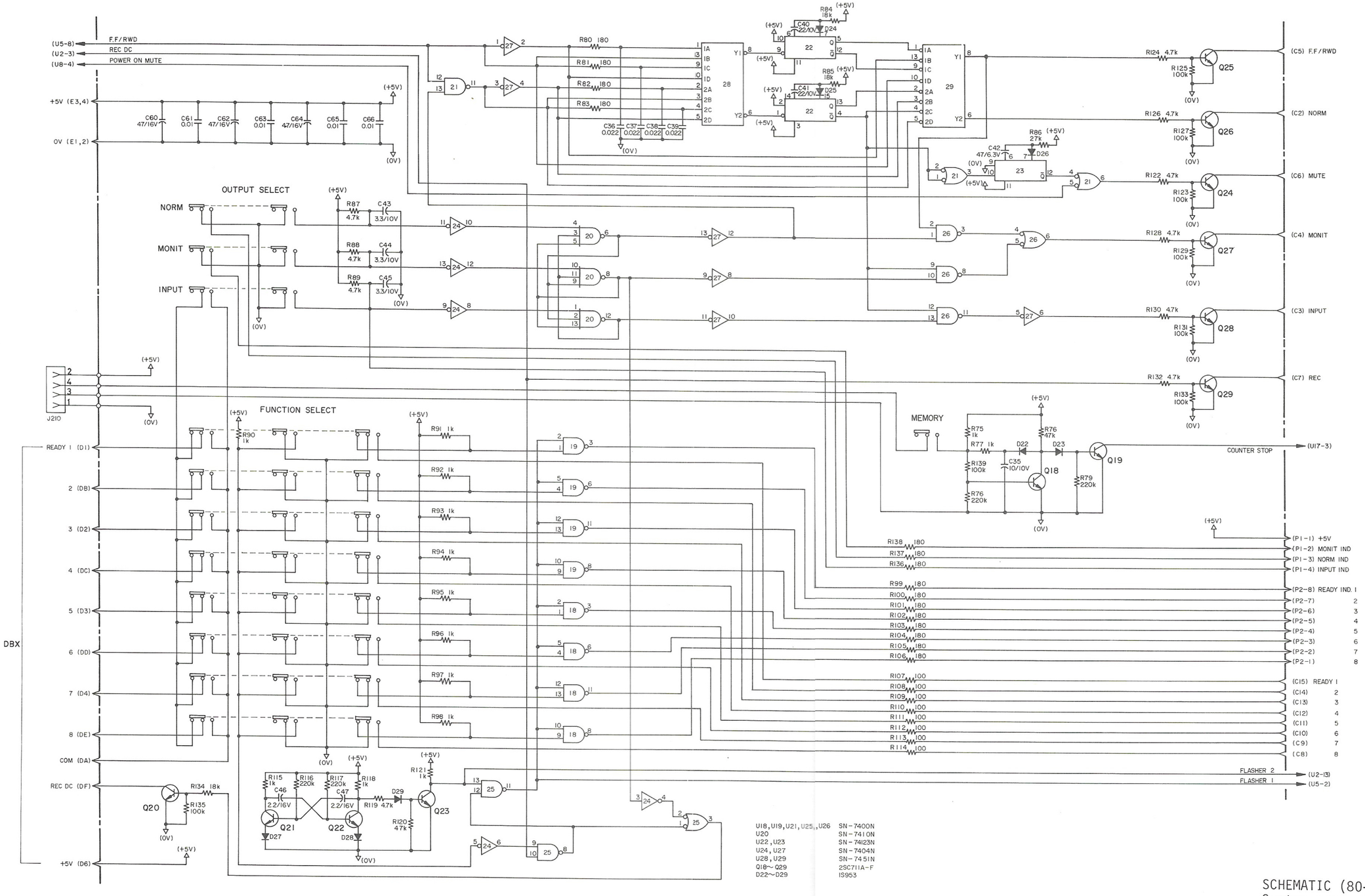
SCHEMATIC (80-8)
Head ass'y
REV. _____

8.2 System control (Function select)
(Applicable up to serial No. 8080971)



SCHEMATIC (80-8)
System control (Function select) PCB ass'y
REV. ____

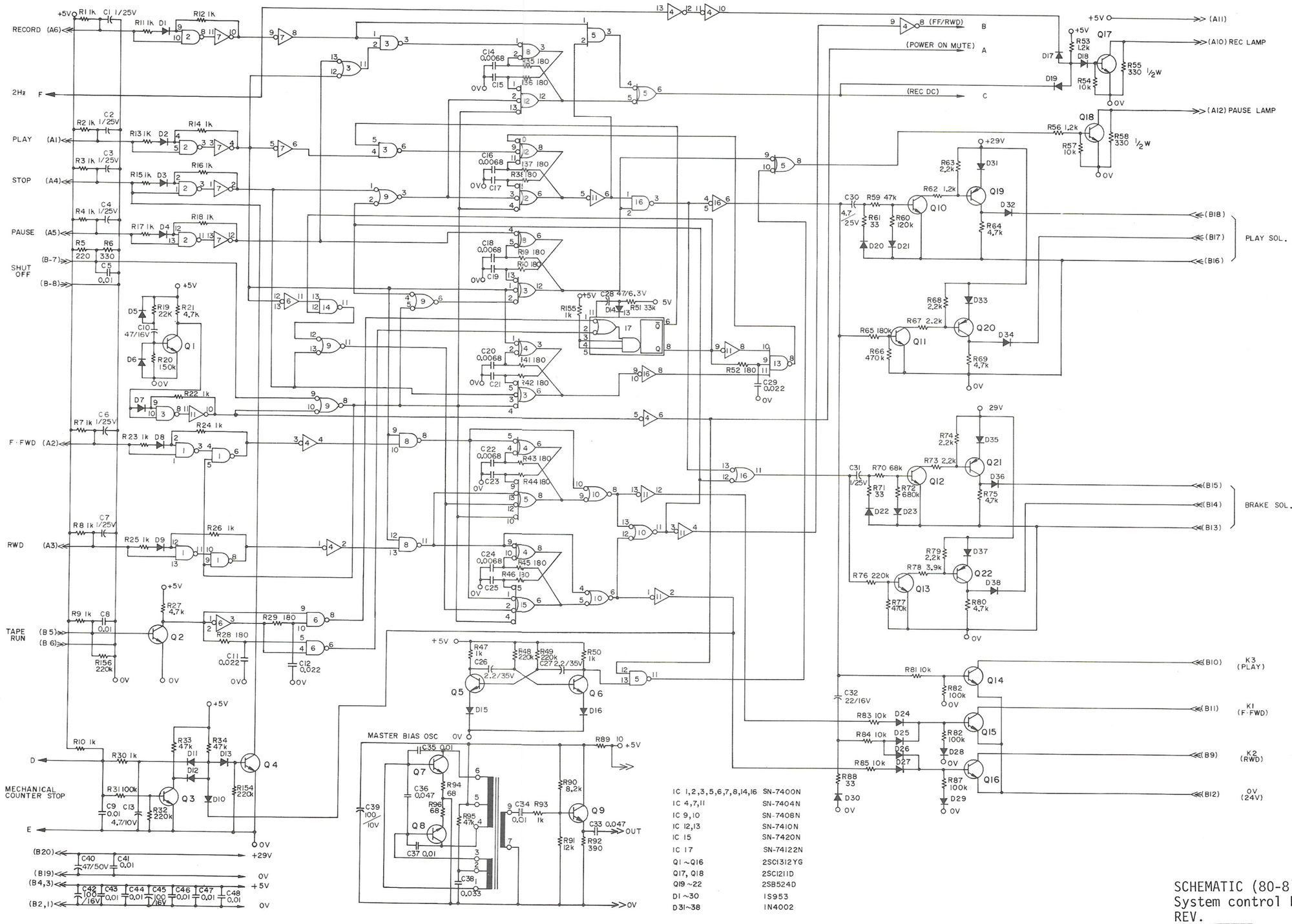
8.2A System control (Function select)
(Applicable from serial No. 8080972 and later)



U18,U19,U21,U25,U26	SN-7400N
U20	SN-7410N
U22,U23	SN-74123N
U24,U27	SN-7404N
U28,U29	SN-7451N
Q18~Q29	2SC711A-F
D22~D29	1S953

SCHEMATIC (80-8)
System control (Function select) PCB ass'y
REV. ____

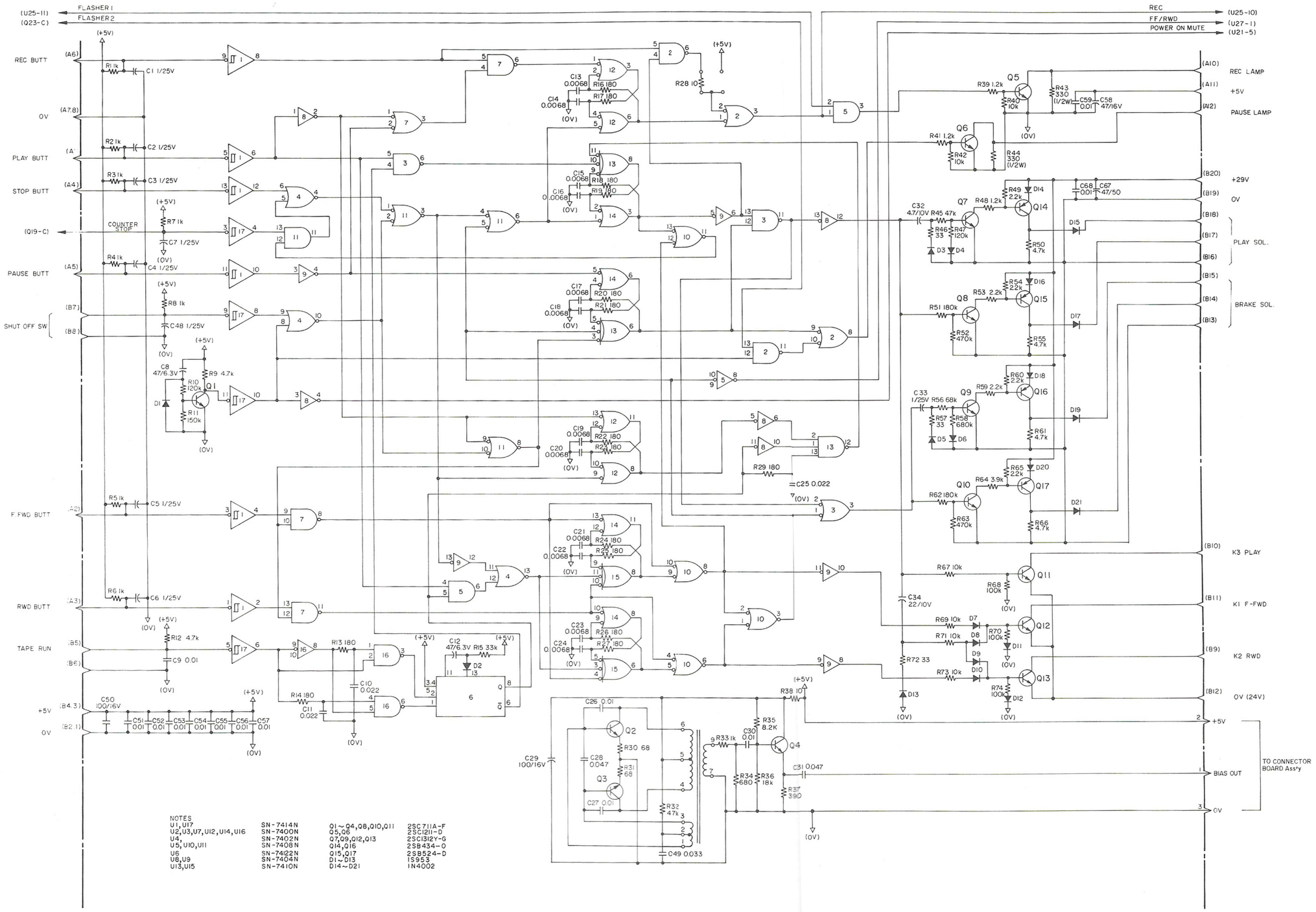
8.3 System control
(Applicable up to serial No. 8080971)



IC 1,2,3,5,6,7,8,14,16	SN-7400N
IC 4,7,11	SN-7404N
IC 9,10	SN-7408N
IC 12,13	SN-7410N
IC 15	SN-7420N
IC 17	SN-74122N
Q1 ~ Q16	2SC1312YG
Q17, Q18	2SC1211D
Q19 ~ 22	2SB524D
D1 ~ 30	1S953
D31~38	1N4002

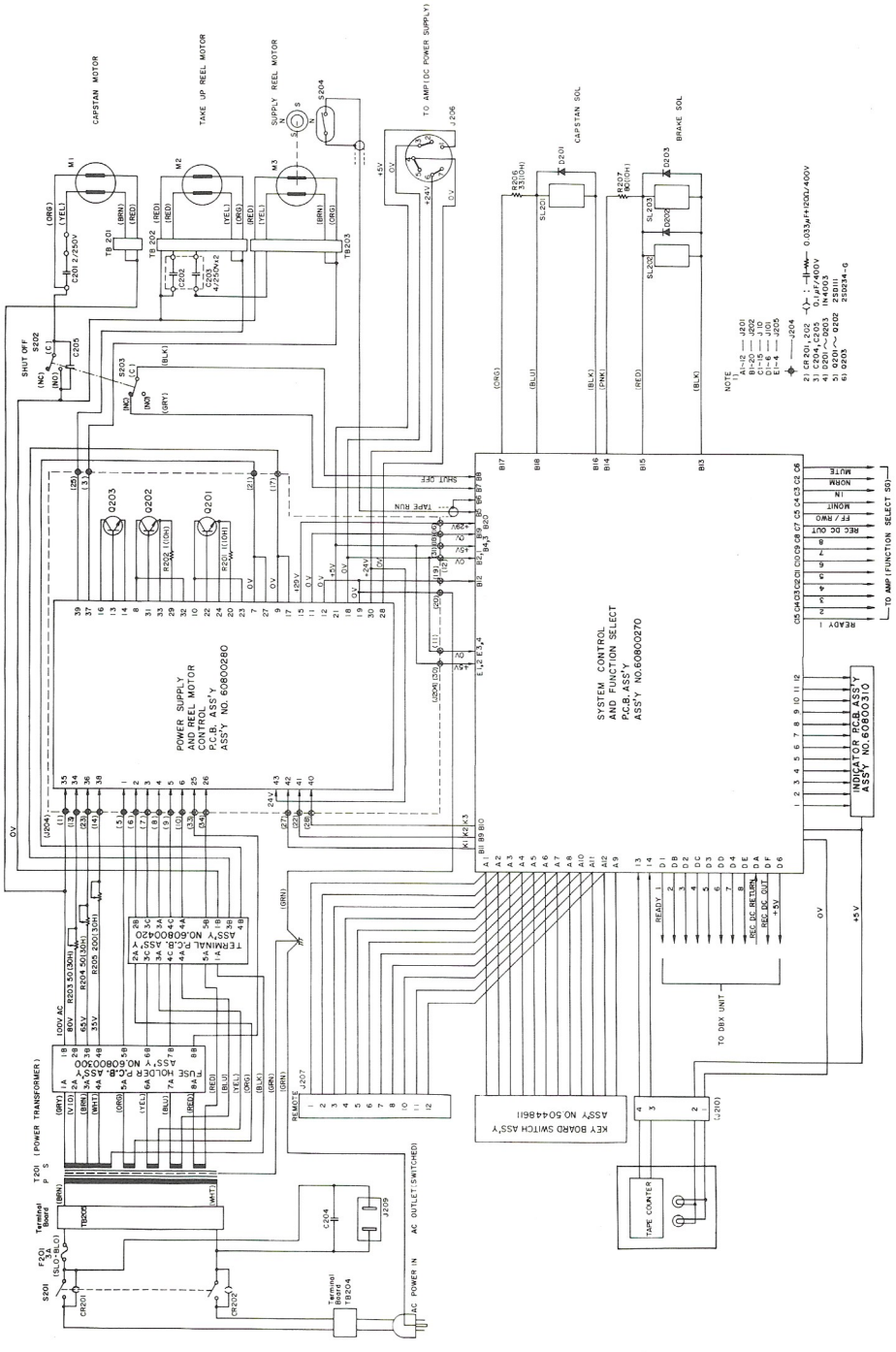
SCHEMATIC (80-8)
System control PCB ass'y
REV. _____

8.3A System control
(Applicable from serial No. 8080972 and later)



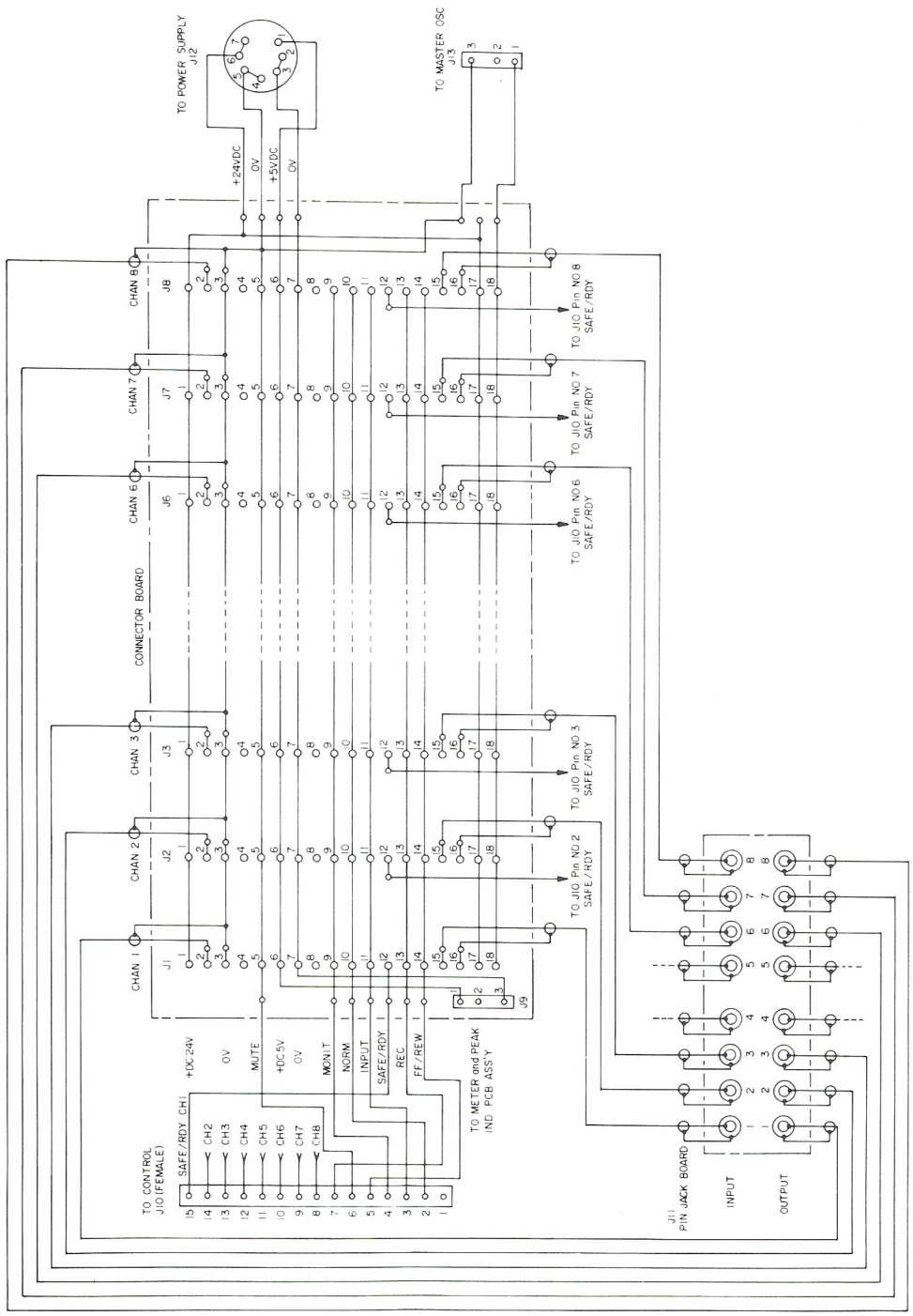
SCHEMATIC (80-8)
System control PCB ass'y
REV. _____

8.4 Transport control


CAPSTAN MOTOR
TAKE UP REEL MOTOR
SUPPLY REEL MOTOR
TO AMP (DC POWER SUPPLY)
SHUT OFF
POWER SUPPLY AND REEL MOTOR CONTROL P.C.B. ASS'Y ASS'Y NO. 60800280
SYSTEM CONTROL AND FUNCTION SELECT P.C.B. ASS'Y ASS'Y NO.60800270
INDICATOR P.C.B. ASS'Y ASS'Y NO.60800310
TERMINAL P.C.B. ASS'Y ASS'Y NO.60800420
FUSE HOLDER P.C.B. ASS'Y ASS'Y NO.60800300
KEY BOARD SWITCH ASS'Y ASS'Y NO 5044811
TAPE COUNTER
TO DBX UNIT
AC POWER IN
AC OUTLET (SWITCHED)
CAPSTAN SOL
BRAKE SOL
TAPE RUN
REC DC OUT
TO AMP (FUNCTION SELECT SIG)
NOTE

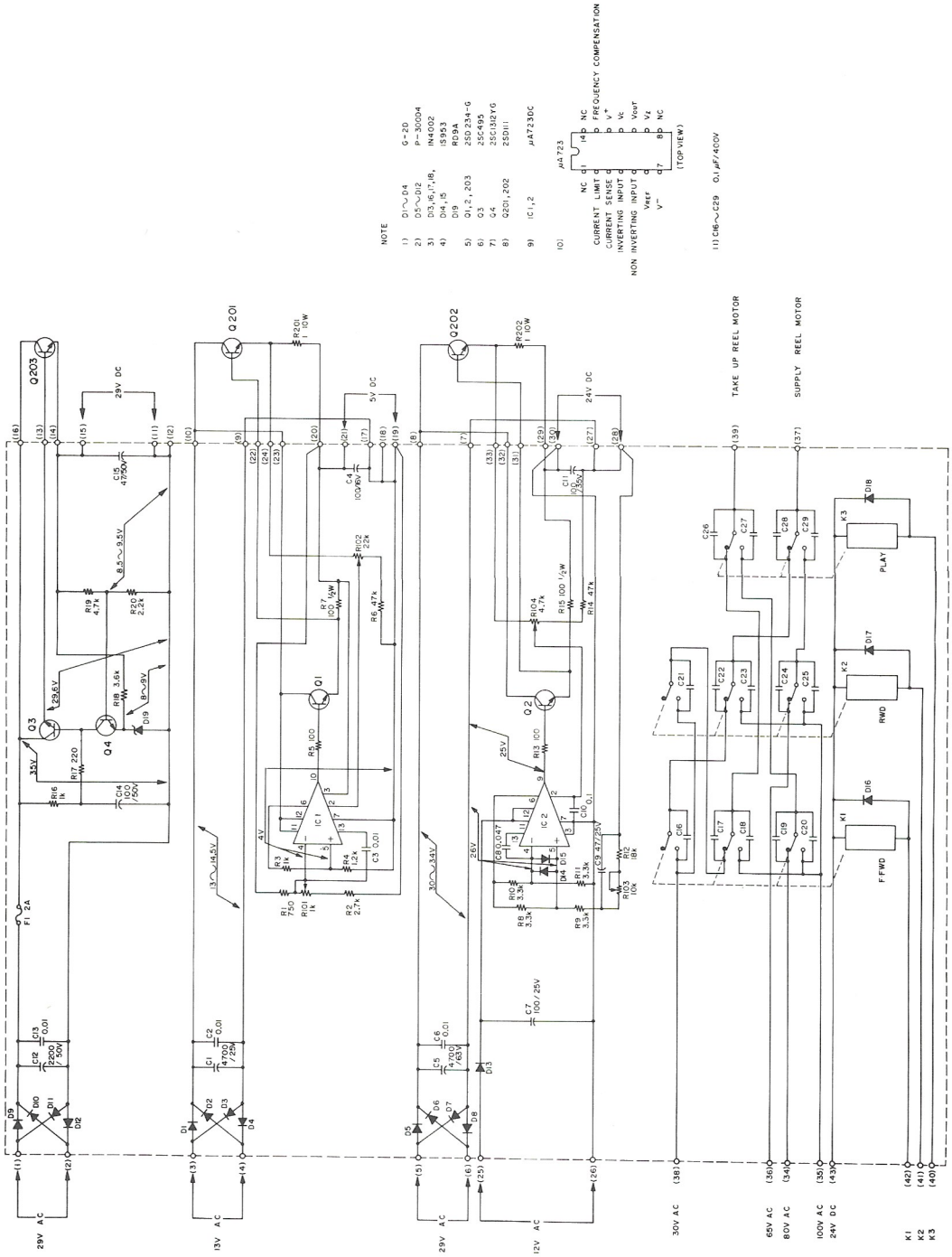
SCHEMATIC (80-8)
Transport control electronics
REV. ____

8.5 Connector board



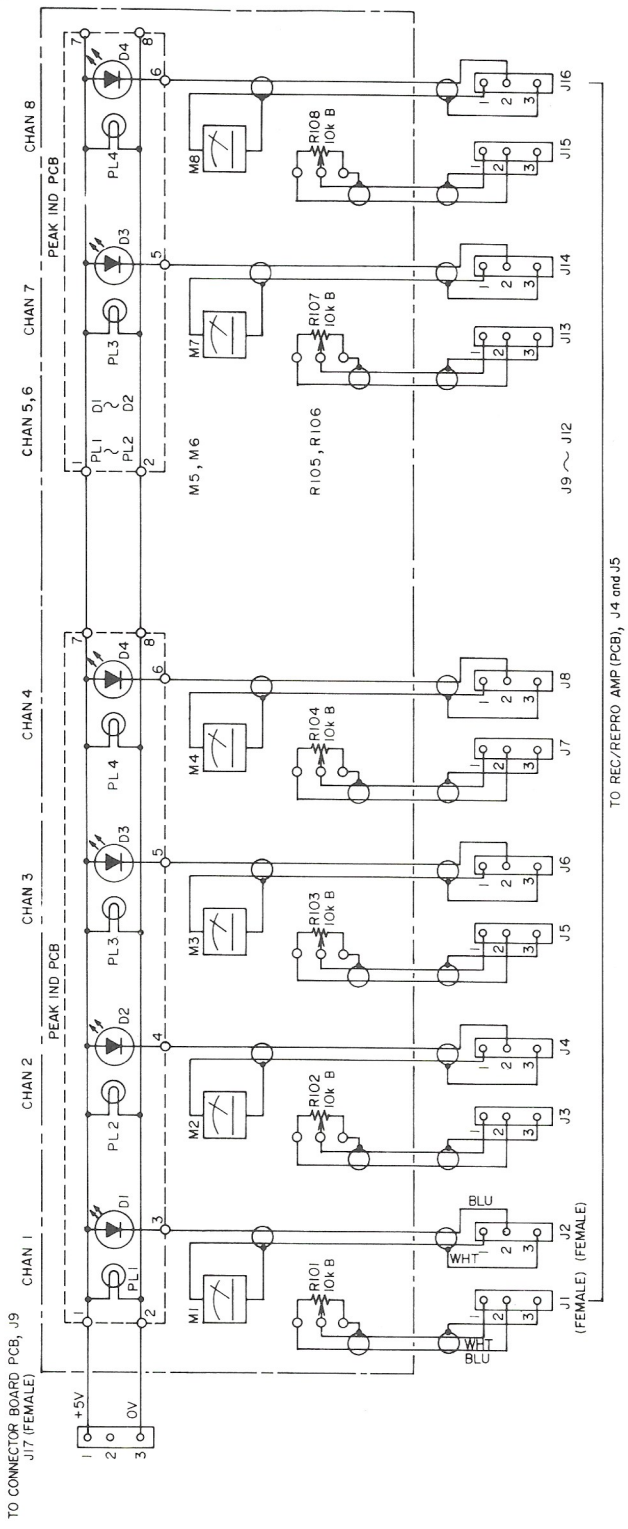
SCHEMATIC (80-8)
Connector board ass'y
REV. ____

8.6 Power supply and reel motor control



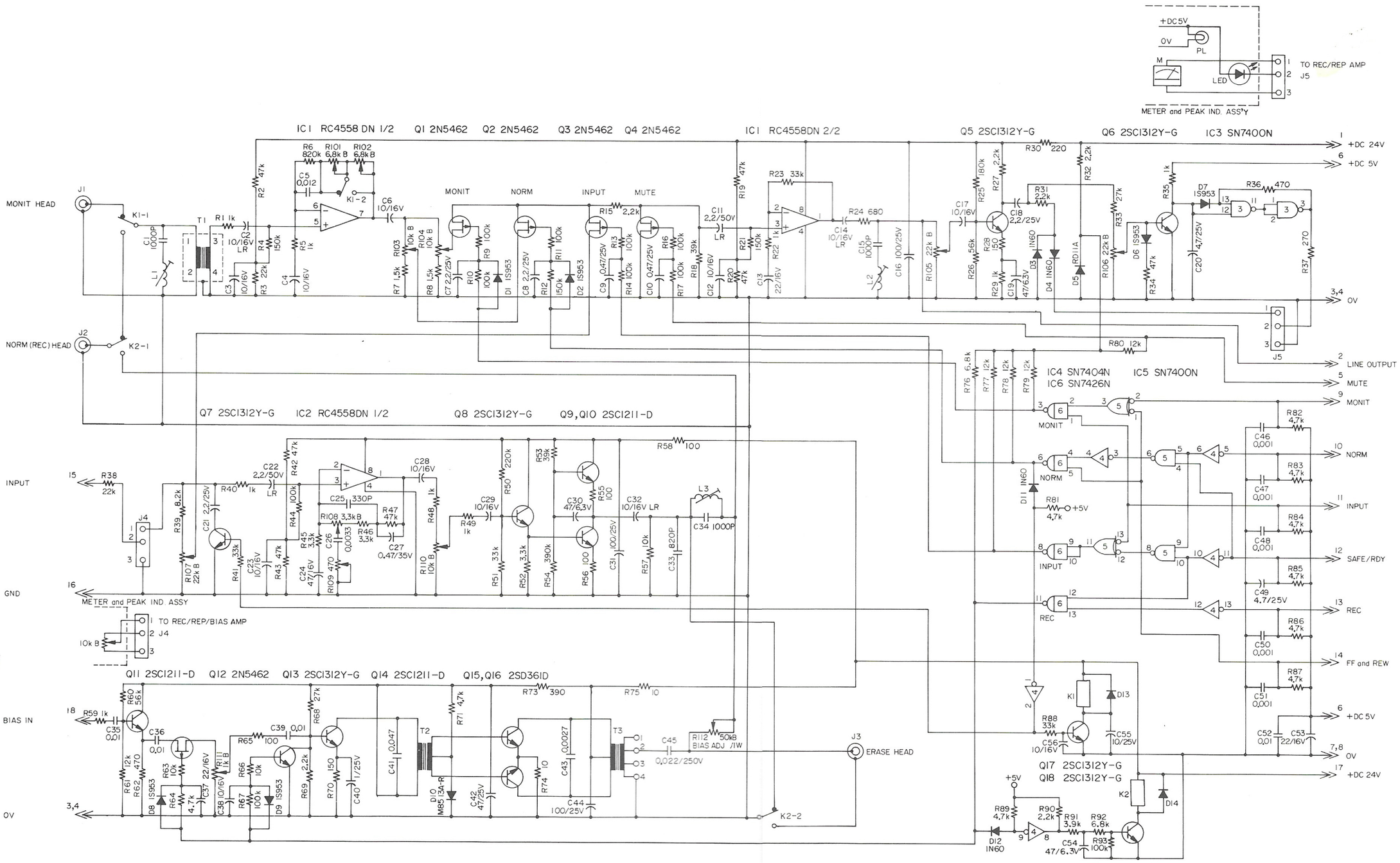
SCHEMATIC (80-8)
Power supply & reel
motor control
REV. _____

8.7 Meter and peak indicator



SCHEMATIC (80-8)
Meter & peak indicator ass'y
REV. _____

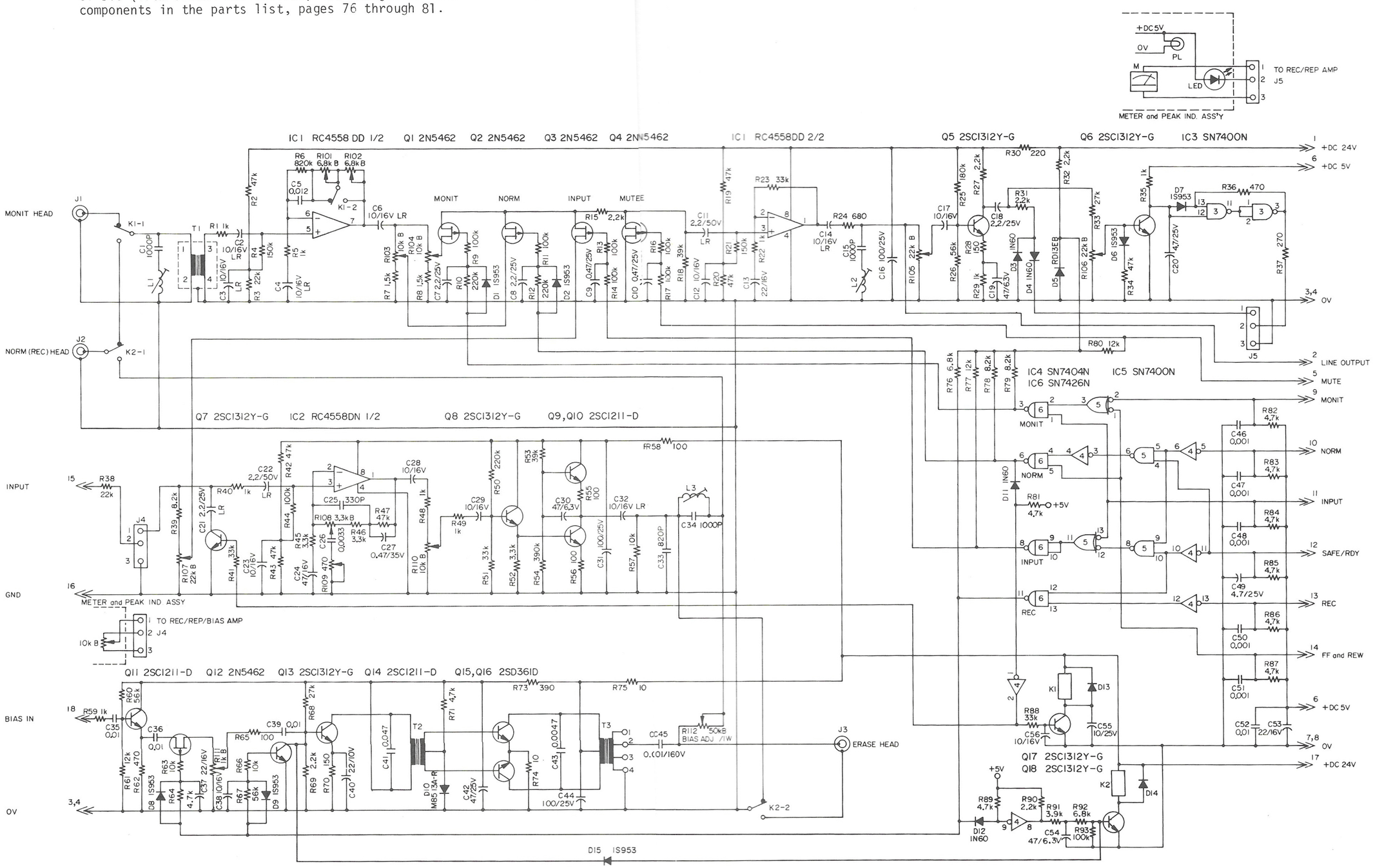
8.8 Record/reproduce amplifier
(Applicable up to serial No. 8080221)



SCHEMATIC (80-8)
Rec/Repro Amp. PCB ass'y
REV. _____

8.8A Record/reproduce amplifier

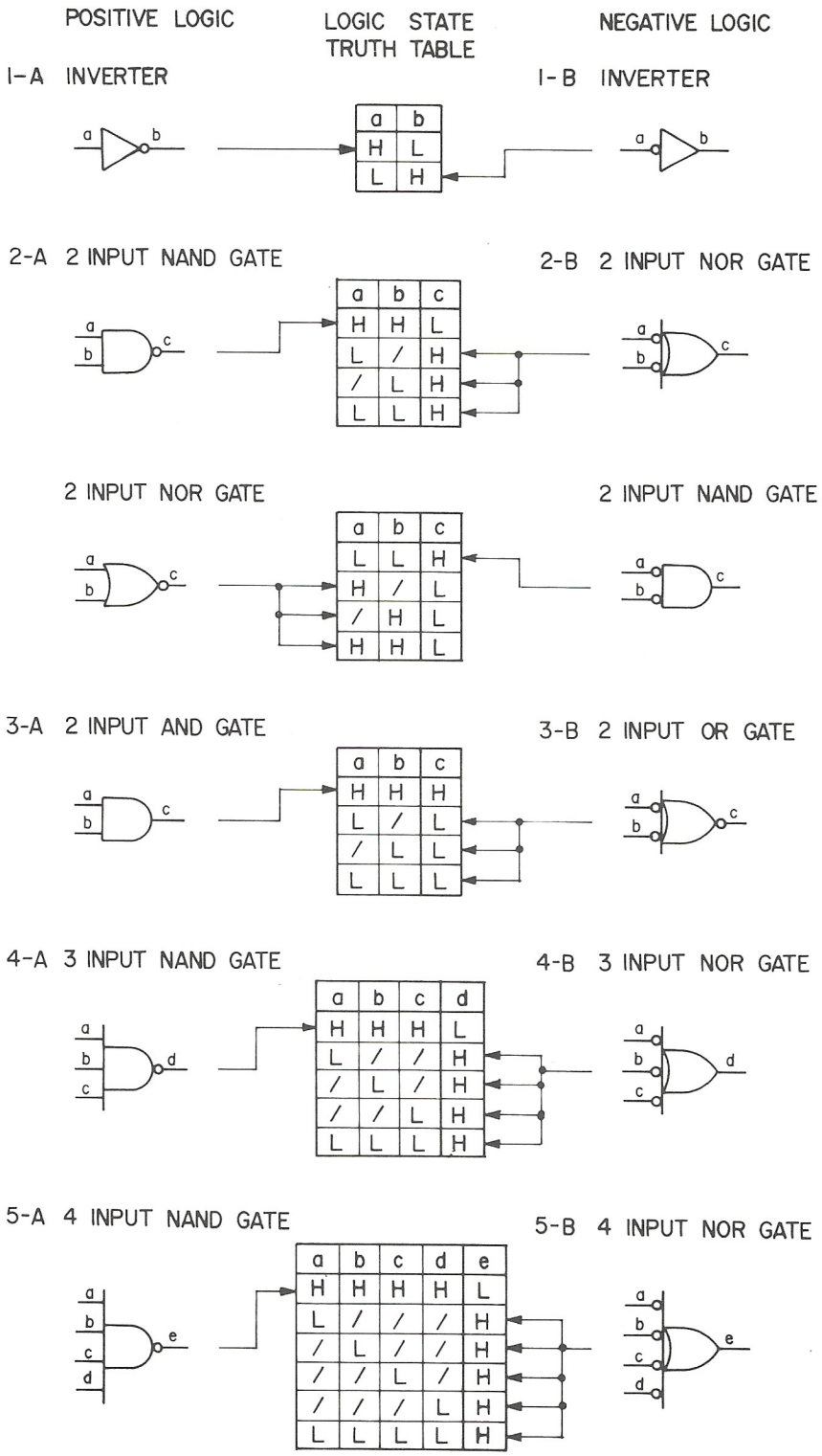
NOTE: This schematic is the same as that in page 95 except for addition of D15 (from serial No. 8080222) and changes of several discrete components in the parts list, pages 76 through 81.



SCHEMATIC (80-8)
Rec/Repro Amp. PCB ass'y
REV. ____

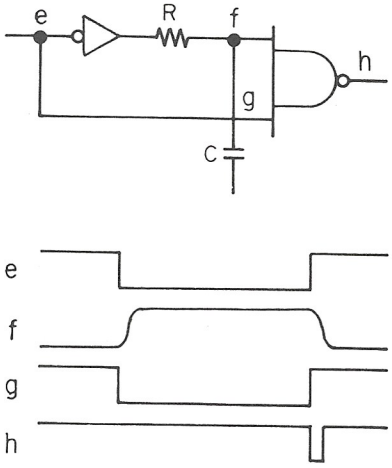
9. THEORY OF OPERATION

9.1 Logic IC's used in the Model 80-8

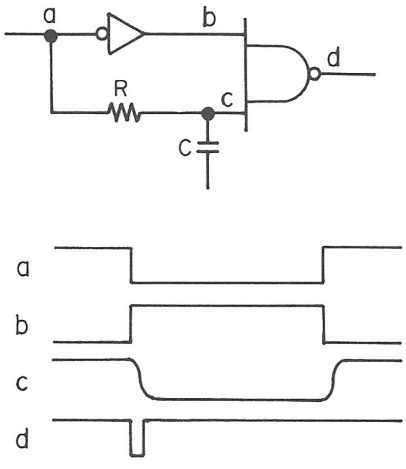


9.2 Pulse Generating Circuit

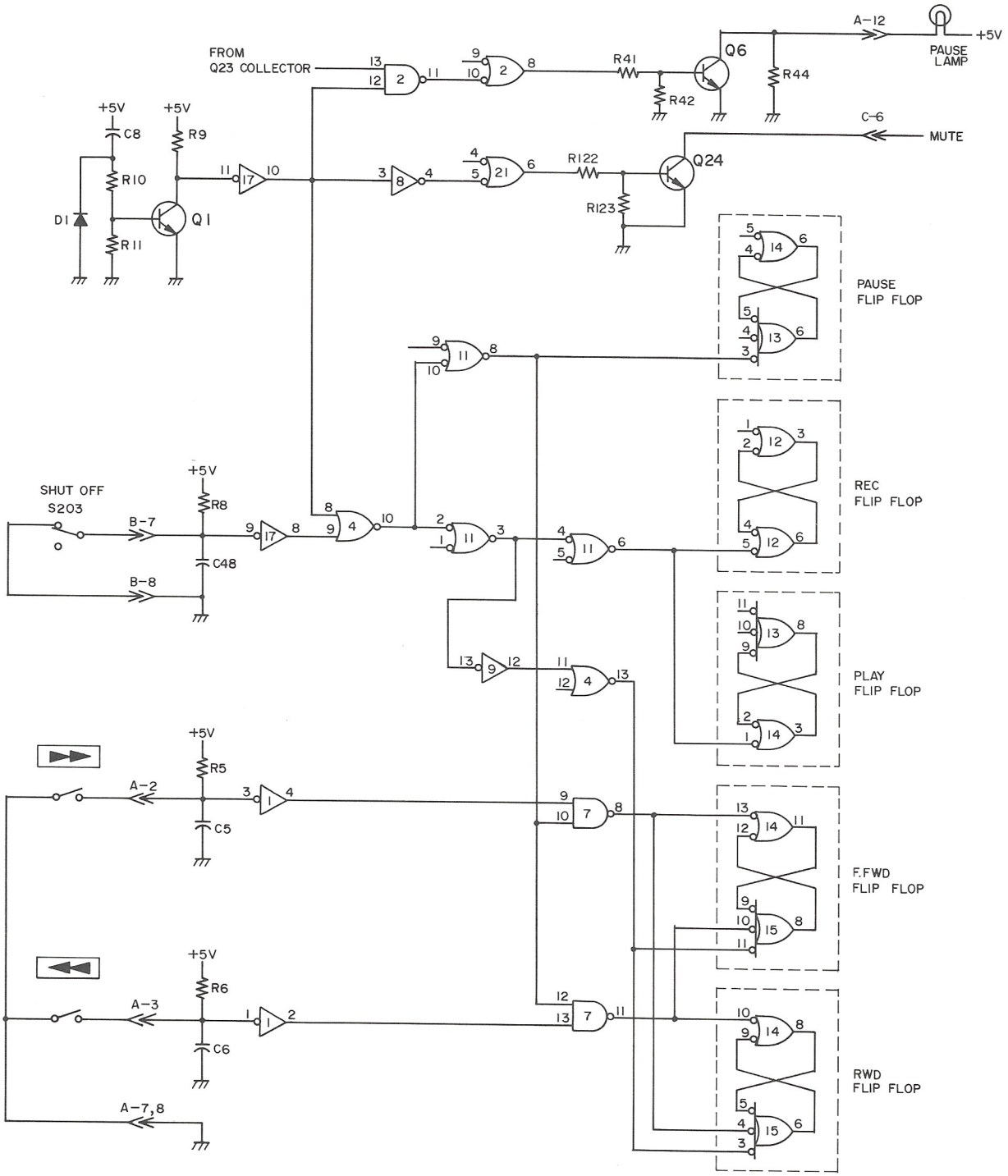
A) ONE PULSE BY RISING EDGE



B) ONE PULSE BY FALLING EDGE



9.3 Power On Reset and Shut Off Modes



9.3 Power On Reset and Shut Off Modes

9.3.1 Power On Reset Mode

1. Q1 is for generating the Power-On-Reset signal. When the main AC power is switched on, +5V applied from the power supply passes through R10, and by effect of R11 and the parallel impedance h_{ie} of Q1 coupled with the time constant of C8, a base current will flow for several hundred millisecond until C8 is completely charged during which time Q1 will be conducting and its collector potential will be about 0.3V. When C8 becomes fully charged, the collector potential will return to about 5V and Q1 will switch off. During this ON state of Q1, all flip flops will be reset, the Pause Lamp will blink, and the POWER ON MUTE signal will be sent to the Record/Reproduce Amplifier.
2. U17-10 is a Schmitt trigger inverter, and during Power-On-Reset, its output pin #10 will go to a high logic level using the squared output waveform of Q1.
   Due to this, input pin #12 of U2-11 goes to a high logic level, thus allowing the Pause Lamp to blink.
3. U8-4 is an inverter, and changes a high logic level input to a low logic level output. This low logic level is sent to pin #5 of U21-6 whose output is then sent to the Record/Reproduce Amplifier as a MUTE signal. (For MUTE, refer to paragraph 9.12 Output Select).
4. U4-10 is a 2-input NOR gate, and its output pin #10 will go to low logic level during Power On Reset.
5. U11-3 is a 2-input OR gate, and when its input pin #2 is a low logic level, its output pin #3 will be a low logic level.
6. U11-6 is a 2-input OR gate, and when its input pin #4 is a low logic level, output pin #6 will go to a low logic level. Therefore, both reset terminals, pin #5 of U12-6 in the RECORD flip flop and pin #1 of U14-3 in the PLAY flip flop will be at low logic levels and these flip flops will be reset.
7. U11-8 is a 2-input OR gate, and when its input pin #10 is a low logic level, its output pin #8 will go to a low logic level. This low logic level output is fed to input pins #10 and #12 of U7-8 and U7-11, respectively, which are the input circuits for F.FWD and RWD, respectively. Then, even if the F.FWD or RWD buttons are pressed during Power-On-Reset, F.FWD or RWD modes will not be achieved. This low logic level output of U11-8 is also sent to the reset terminal, pin #3 of U13-6 in the PAUSE flip flop, thus allowing the PAUSE flip flop to be reset.
8. U9-12 is an inverter, and allows input pin #11 of U4-13 to be at a high logic level.
9. U4-13 is a 2-input NOR gate, and when its input pin #11 is at a high logic level, its output pin #13 will go to a low logic level. Therefore, both reset terminals, pin #11 of U15-8 in the F.FWD flip flop and pin #3 of U15-6 in the RWD flip flop will be at low logic levels, and these flip flops will be reset.
10. Since U2-11 is a 2-input NAND gate which always has an approximately 2Hz square wave applied to pin #13, output pin #11 of U2-11 will output this 2Hz square wave when input #12 is at high logic level (only during Power-On-Reset).

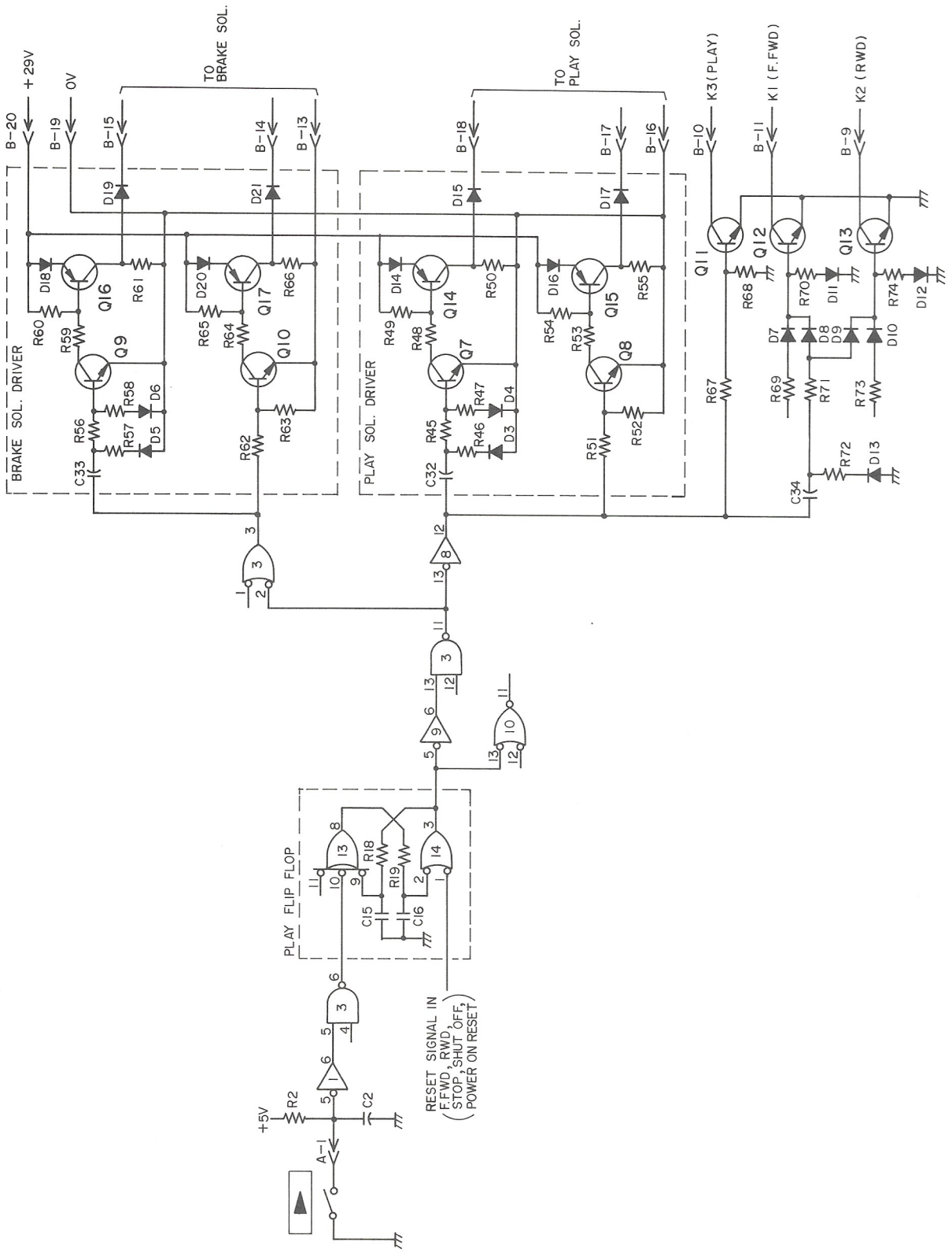
11. U2-8 is a 2-input NOR gate, and since pin #9 goes to a low logic level during the PAUSE mode and also an approximately 2Hz square wave is fed to pin #10 during Power-On-Reset, a high logic level is sent out from output pin #8 during the Pause mode and an approximately 2Hz square wave is sent out during Power-On-Reset.
12. Q6 is a Pause Lamp Driver, and it allows the Pause Lamp to ignite continuously by the ON state of Q6 during the PAUSE mode, and allows the Pause Lamp to blink by repeating of the ON and OFF states with the approximately 2Hz square wave signal during Power-On-Reset.

9.3.2 Shut Off Mode

Two Shut Off switches are interlocked to the right tension arm.
One switch (S203) is used to reset the System Control Logic. The other switch (S202) is employed for ON-OFF of power to the capstan motor.

1. When the right tension arm is in the shut-off position, Shut Off switch (S203) in the tape transport will be closed, thus making a short between B-7 and B-8.
2. Due to R8, B-7 is held at a high logic level in any mode other than Shut Off, and will be at a low logic level during the Shut Off state.
3. U17-8 is a Schmitt trigger inverter which converts into a sharp pulse the slow rising waveform created by effect of R8 and C48. During the Shut Off state, output pin #8 will be at high logic level.
4. U4-10 is a 2-input NOR gate, and when input pin #9 is at high logic level, output pin #10 will go to the low logic level.
   Accordingly, output pin #10 of U4-10 will be at the low logic level during the Power-On-Reset or Shut Off state.
   Since this circuit operates in conjunction with the Power-On-Reset circuit, refer to paragraph 9.3.1.

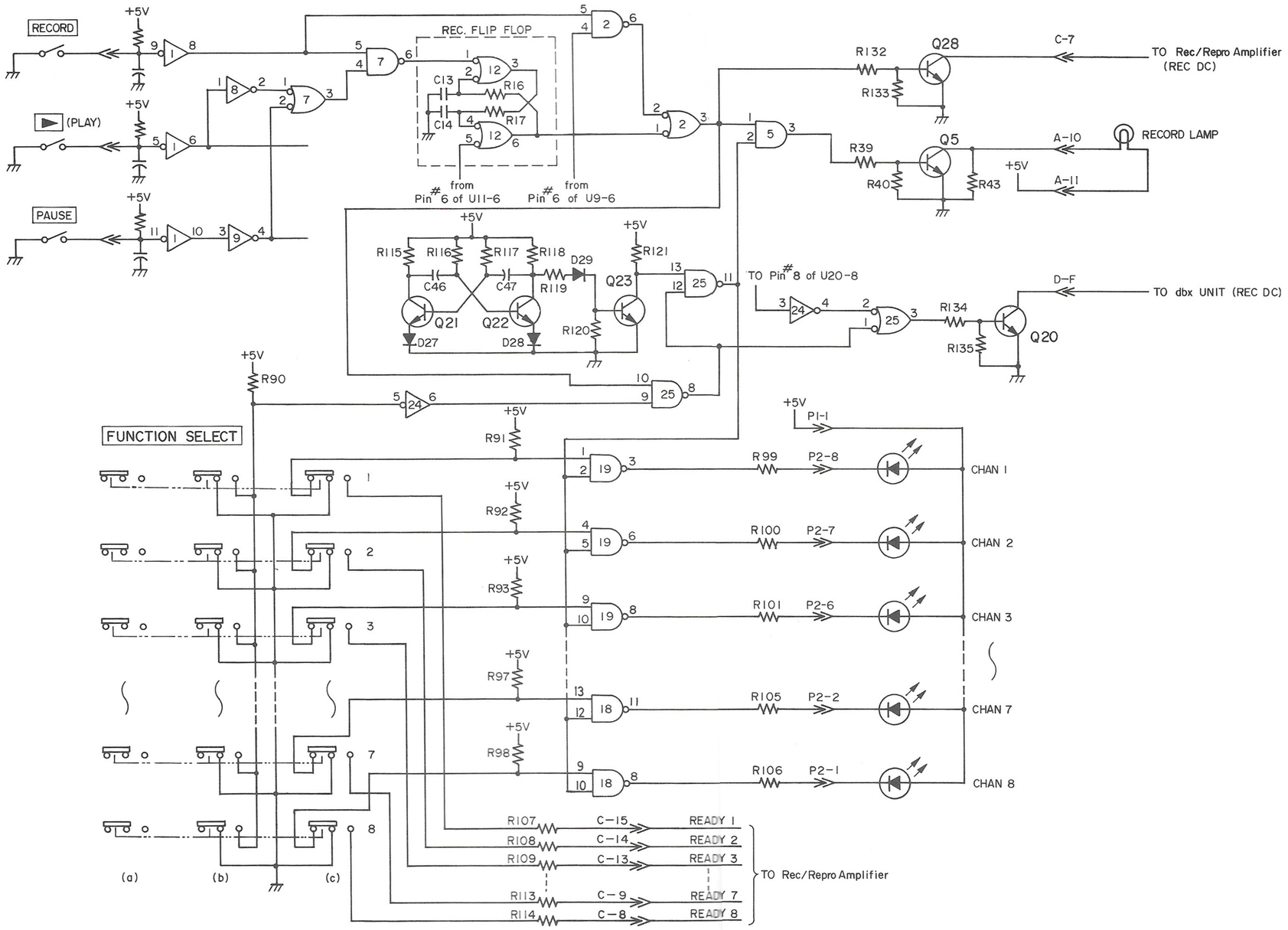
9.4 Play Mode Control Function



9.4 Play Mode Control Function

1. When the PLAY button is depressed, input pin #5 of the Schmitt trigger U1-6 will go to a low logic level, and pin #6 of U1 will be at a high logic level only while the PLAY button is held depressed.
2. This high logic level output from the Schmitt trigger is applied to pin #5 of U3-6.
3. In addition to the high logic level to pin #5 of the 2-input NAND gate U3-6, when the remaining pin #4 pin (*) is also at high logic level, output pin #6 of U3-6 will be at low logic level.

   * When the PLAY button is depressed during tape travel other than PLAY, pin #4 of U3-6 will remain at low logic level. In other words, pin #4 will be at high logic level only when the tape is stopped (not during tape run).
4. U13-8 and U14-3 form the PLAY flip flop, and at the moment the power supply is turned on, the output at U14 pin #3 will go to a high logic level by the Power-On-Reset signal (low logic level) applied to pin #1 of U14-3.
   When a low logic level is applied to pin #11 or #10 of U13-8, the flip flop will change states and a low logic level will be output from pin #3 of U14-3.
   Since pin #3 of U14-3 and pin #9 of U13-8 are interconnected, as long as pin #3 of U14 is at low logic level, it will remain so unless reset signals from F.FWD, RWD, STOP or SHUT OFF are input to pin #1 of U14-3.
5. Output pin #6 of inverter U9-6 will go to a high logic level when a low logic level is applied to pin #5. This feature is utilized for Record PUNCH IN mode explained on page 107.
6. U3-11 is a 2-input NAND gate. It will put out a low logic level to the inverter U8-12 only when the input pins #12 and #13 are both at high logic levels.
7. The high logic level output from pin #12 of inverter U8-12 is applied to the PLAY solenoid driver transistors Q7, Q14, Q8, and Q15; and Q11 for the PLAY relay.
8. U3-3 is a 2-input NOR gate and when a low logic level output from the 2-input NAND gate U3-11 is applied to pin #2 of U3-3, a high level will be output from pin #3 which is applied to the BRAKE solenoid driver transistors Q9, Q16, Q10, and Q17.
9. Q12 and Q13 also work, in addition to their F.FWD and RWD functions, as a circuit to lessen slackness of the tape during acceleration in the PLAY mode. When the U8-12 output becomes a high logic level, base current will flow to Q12 and Q13 via C34.
   While C34 is charging, Q12 and Q13 will go to the ON state, thus energizing K1 and K2.


RECORD
(PLAY)
PAUSE
+5V
REC. FLIP FLOP
C13
C14
R16
R17
from Pin # 6 of U11-6
from Pin # 6 of U9-6
R115
R116
R117
R118
D29
R119
C46
C47
Q21
Q22
Q23
D27
D28
R120
R121
R132
R133
Q28
C-7
TO Rec/Repro Amplifier (REC DC)
R39
R40
Q5
R43
A-10
A-11
RECORD LAMP
TO Pin # 8 of U20-8
R134
R135
Q20
D-F
TO dbx UNIT (REC DC)
R90
R91
R92
R93
R97
R98
FUNCTION SELECT
(a)
(b)
(c)
P1-1
R99
R100
R101
R105
R106
P2-8
P2-7
P2-6
P2-2
P2-1
CHAN 1
CHAN 2
CHAN 3
CHAN 7
CHAN 8
R107
R108
R109
R113
R114
C-15
C-14
C-13
C-9
C-8
READY 1
READY 2
READY 3
READY 7
READY 8
TO Rec/Repro Amplifier

9.5 Recording Mode Control Function

Four different recording modes can be selected on the Model 80-8 depending on how the RECORD, PLAY, PAUSE, or FUNCTION SELECT buttons on the control panel are depressed.

9.5.1 Variations in Recording Modes

1. Normal recording: First, depress the FUNCTION SELECT button(s) for the channel(s) you wish to record on; then, depress the RECORD and PLAY buttons at the same time.
2. Punch-in recording (I): Depress the FUNCTION SELECT button for the channel to be recorded on; then run tape in the PLAY mode.
   When the running tape reaches the point where the new program is to be punched-in, depress the RECORD button only.
3. Punch-in recording (II): Without depressing any of the FUNCTION SELECT buttons, depress the RECORD and PLAY buttons simultaneously to put the deck in the PLAY mode (Record Standby state). Depress the FUNCTION SELECT button(s) for the channel(s) on which Punch-in recording is to be done.
4. Using the PAUSE button for recording: First, depress the FUNCTION SELECT button of the desired recording channel, then, depress the RECORD and PAUSE buttons simultaneously.
   To put the Model 80-8 in the RECORD mode, depress the PLAY button to cancel the Record Pause mode.

Each channel can be put in the record mode only when low logic level signals arrive at the control circuit of each record/reproduce amplifier from both the FUNCTION SELECT circuit and the Record flip flop. Since the REC DC signal, generated by the set state of the Record flip flop, is simultaneously fed to all of the record/reproduce amplifiers, the only other signal required to put any particular channel into the RECORD mode is the READY signal which is obtained by depressing the FUNCTION SELECT button for the desired channel.

9.5.2 Operating Principle

1. U1-8 is a Schmitt trigger inverter, and when the RECORD button is depressed, output pin #8 will go to a high logic level.
2. U1-6 is also a Schmitt trigger inverter, and when the PLAY button is depressed, output pin #6 will go to a high logic level.
3. U1-10 is another Schmitt trigger inverter, and when the PAUSE button is depressed, output pin #10 will go to a high logic level.
4. U7-6 is a 2-input NAND gate, and when the RECORD button and either the PLAY or PAUSE button is depressed, output pin #6 will go to a low logic level.
5. The RECORD flip flop is made up of U12-3 and U12-6.
   This flip flop will go to the set state when a low logic level is fed to input pin #1 of U12-3, and remains in this set state with output pin #6 of U12-6 at the low

logic level, unless a low logic level is fed to pin #5 of U12-6 (The conditions for pin #5 of U12-6 to go to a low logic level is limited to when STOP, SHUT-OFF, Power-On-Reset, F.FWD or RWD modes are selected).

6. U2-3 is a 2-input NOR gate, and as long as the RECORD flip flop is in the set state or the RECORD button is held down in the PLAY mode, this output pin #3 will be at a high logic level.
7. U2-6 is a 2-input NAND gate. Pin #4 will always be at a high logic level during the PLAY mode, and as long as the RECORD button is being pressed, pin #6 will put out a low logic level (used for Punch-in recording).
8. U8-2 is an inverter, and when the PLAY button is depressed, output pin #2 will go to a low logic level.
9. U7-3 is a 2-input NOR gate, and when either the PLAY or PAUSE button is depressed, output pin #3 will go to a high logic level.
10. U5-3 is a 2-input AND gate, and during the RECORD mode (while the RECORD flip flop is in the set state or while the RECORD button is held depressed in the PLAY mode), input pin #1 will be at a high logic level. As long as any one of the FUNCTION SELECT button is depressed and the RECORD flip flop is in the set state, or as long as the RECORD button is held depressed in the PLAY mode, pin #2 will go to a high logic level. Consequently, output pin #3 of U5-3 will go to a high logic level.
    However, since an approximately 2Hz square wave signal will be fed to input pin #2 of U5-3 as long as no FUNCTION SELECT button for any channel is selected, an approximately 2Hz square wave will be sent out from the output pin #3 of U5-3 when the RECORD flip flop is in the set state or when the RECORD button is depressed in the PLAY mode.
11. Each channel switch actuated by the FUNCTION SELECT button have three separate sections or circuits.
    a) is the circuit for controlling the Remote Control dbx Unit.
    b) is the circuit that will go to a low logic level when any one or more FUNCTION SELECT buttons are depressed, and is an OR circuit for all switches of each channel.
    c) is the circuit that sends the Record READY signal output to each channel of the Record/Reproduce Amplifier and for making the Gate signal to ignite, blink or extinguish the indicators located above the FUNCTION SELECT buttons.
12. U24-6 is an inverter, and input pin #5 will be at high logic level since there will be no voltage drop across R90 when no FUNCTION SELECT button is depressed.
    When any one or more buttons are depressed, input pin #5 will go to a low logic level and output pin #6 will send out a high logic level.
13. U25-8 is a 2-input NAND gate, and when any one or more of the FUNCTION SELECT buttons are depressed, input pin #9 will go to high logic level and thus, output pin #8 will go to a low logic level.
14. U25-11 is a 2-input NAND gate, and an approximately 2Hz square wave signal is always fed to input pin #13. Accordingly, when input pin #12 is at high logic level, output pin #11 will send out an approximately 2Hz square wave signal.

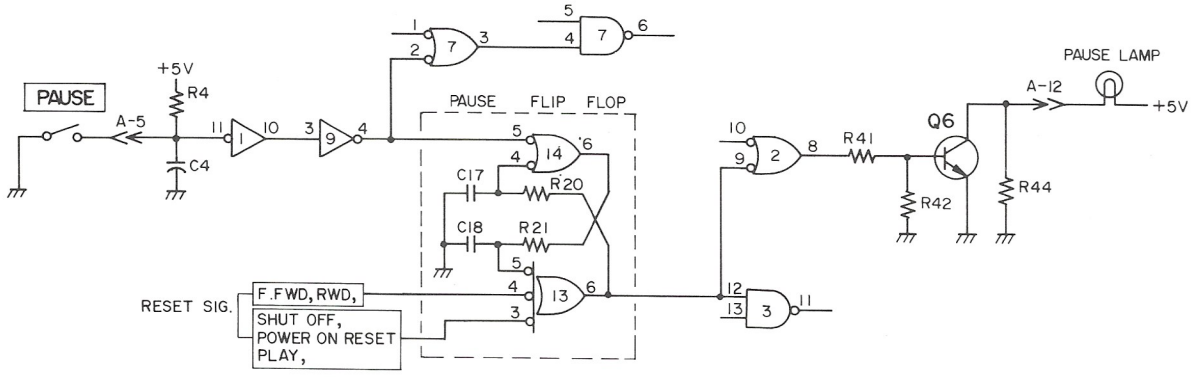
However, when input pin #12 is at low logic level, output pin #11 will send out a high logic level.

15. U19-3, 6, 11, 8 and U18-3, 6, 11, 8 are 2-input NAND gates, and are drivers for the indicators (LED) located above the FUNCTION SELECT buttons.
Since the respective input pins #2, 5, 12, 10 of U19 and Pins #2, 5, 12, 10 of U18 are connected to output pin #11 of U25-11, the respective output pins #3, 6, 11, 8 of U19 and Pins #3, 6, 11, 8 of U18 will change state when any FUNCTION SELECT button is depressed and according to the output state of U25-11, will cause the indicators (LED) to either ignite continuously or blink.

16. U24-4 is an inverter, and when any button other than the MONITOR of the OUTPUT SELECT buttons is depressed, output pin #4 will go to a low logic level.

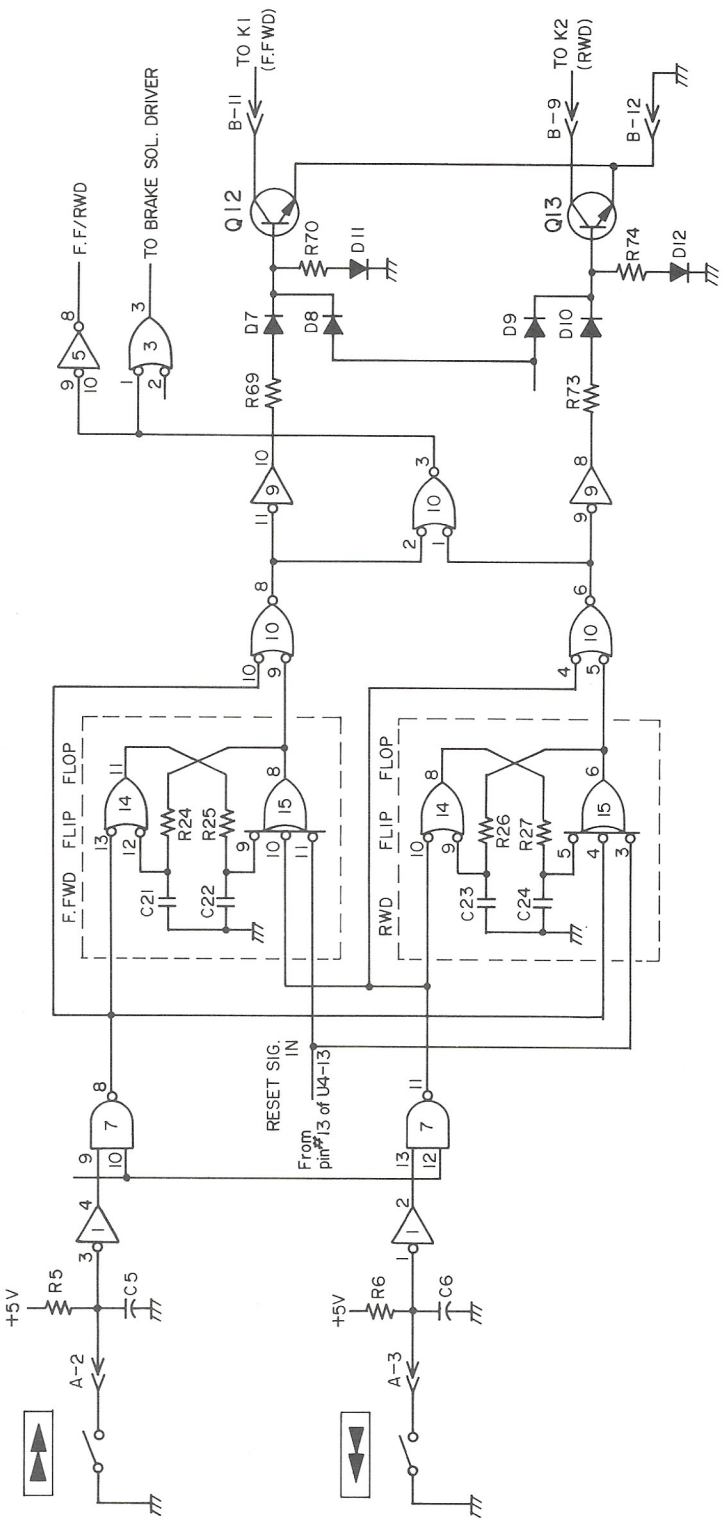
17. U25-3 is a 2-input NOR gate, and when any one or more FUNCTION SELECT buttons are depressed and when output pin #3 of U2-3 is at high logic level, or when either the INPUT or NORM button of the OUTPUT SELECT buttons is depressed, output pin #3 of U25-3 will go to a high logic level. Due to this, transistor Q20 will go to the ON state and thus send a low logic level REC DC signal to the Record/Reproduce Amplifier.

9.6 Pause Mode



1. When the PAUSE button is depressed, input pin #11 of the Schmitt trigger inverter U1-10 will go to a low logic level and its output pin #10 will be at a high logic level only as long as the PAUSE button is held depressed.
2. This high logic level output from the Schmitt trigger is inverted by U9-4 and the resulting low level is applied to pin #2 of U7-3 and pin #5 of U14-6.
3. U7-3 is a 2-input NOR gate and when a low logic level output from U9-4 is applied to its pin #2, a high logic level will be output from pin #3. This high logic level is sent out to input pin #4 of U7-6 as the gate signal for the REC-PAUSE mode.
4. The PAUSE flip flop, made up of U14-6 and U13-6, will be set when the PAUSE button is depressed.
   Also, this flip flop will be reset when the PLAY button is depressed, and during fast winding modes and the shut-off mode.
5. This low logic level from the PAUSE flip flop is also applied to input pin #12 of U3-11 to release the Play and Brake solenoids, and to cut off current to the reel motors.
6. U2-8 is a 2-input NOR gate, and when a low logic level output from U13-6 is applied to its pin #9, a high logic level will be output from pin #8.
7. When pin #8 of U2-8 goes to a high logic level, the base current of Q6 will flow to pin #8 via R41, and Q6 will switch ON to ignite the PAUSE lamp.

9.7 Fast Forward and Rewind Modes

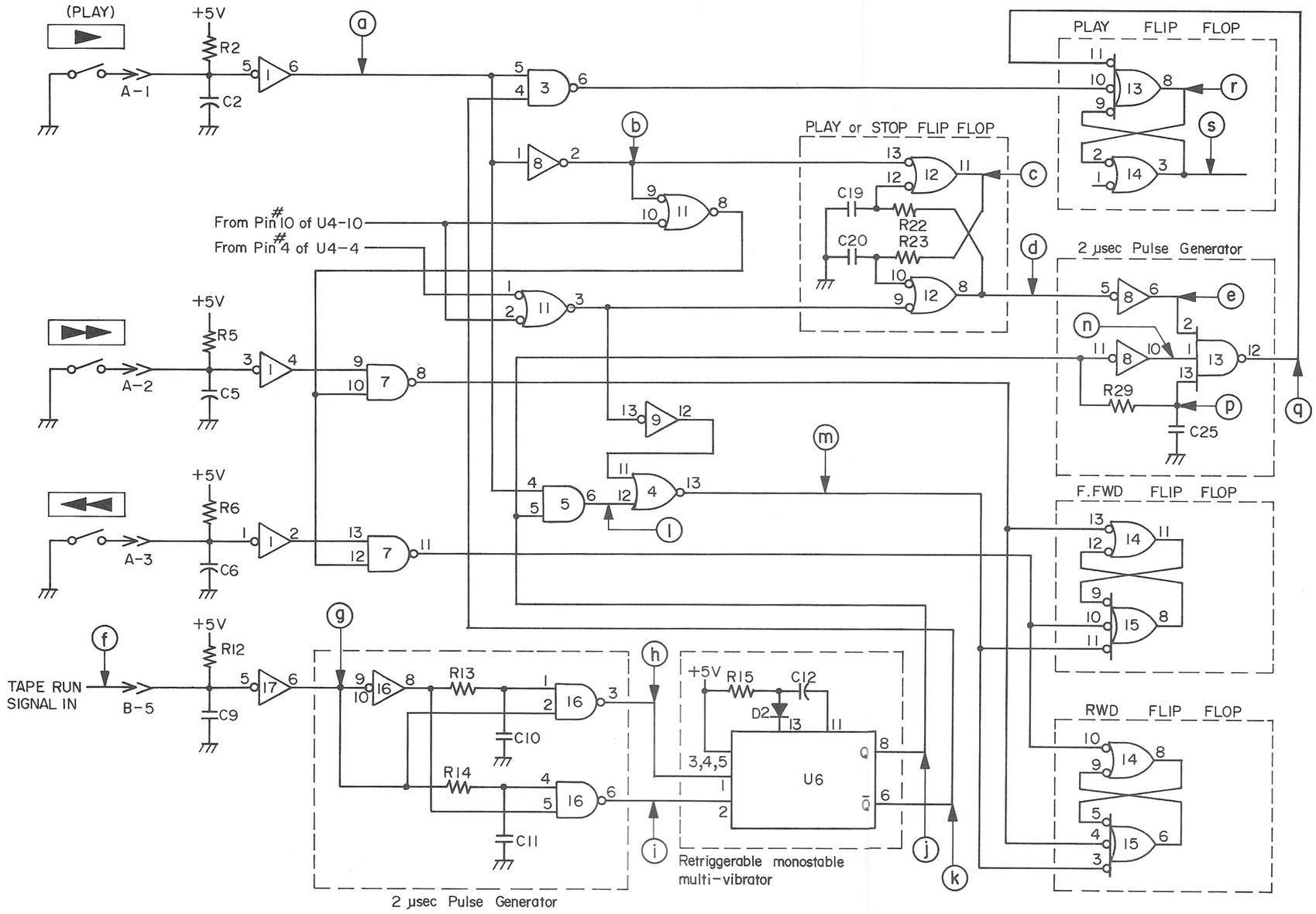


9.7 Fast Forward and Rewind Modes

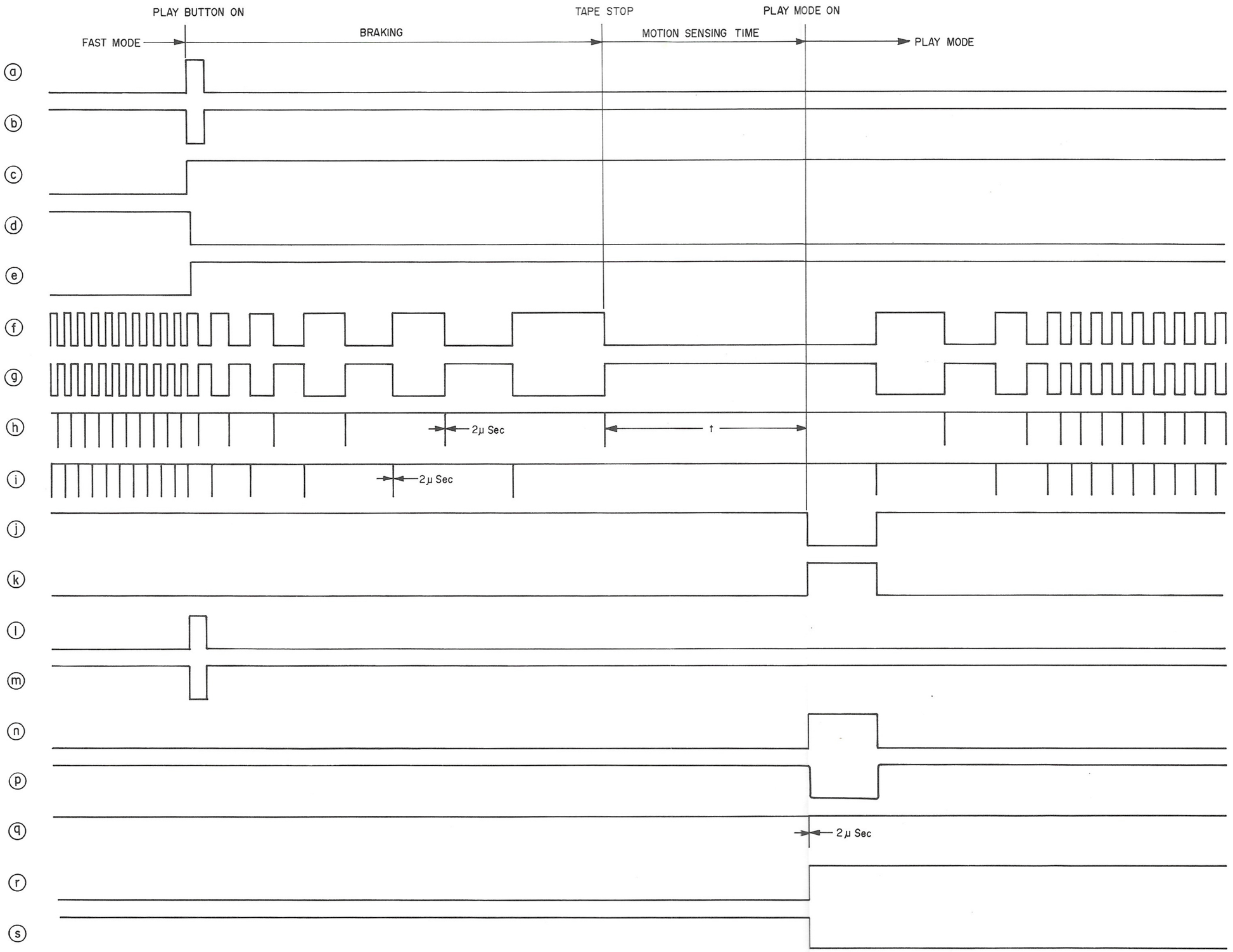
In the F.FWD and RWD modes of operation, one means of control is by the F.FWD button and the RWD button on the tape transport control panel, and the other is by the automatic action controlled by the Motion Control Circuit (see paragraph 9.8 for Motion Control theory).
Also, when the F.FWD and RWD buttons are simultaneously depressed, the torque of both the TAKE-UP and SUPPLY reel motors will be equal to allow quick and easy CUE operation.

1. U1-4 is a Schmitt trigger inverter and as long as the F.FWD button is held down, output pin #4 will be at a high logic level.
2. U7-8 is a 2-input NAND gate and when the F.FWD button is depressed and the other input pin #10 is at a high logic level (it will be at high when the PLAY button is not depressed and when not in the Shut-off or Power-On-Reset state), a low logic level will be output from pin #8 to set the F.FWD flip flop and reset the RWD flip flop.
3. The F.FWD flip flop is made up of U14-11 and U15-8, and will be set when the F.FWD button is depressed.
   Also, this flip flop will be reset when the RWD button is depressed or a low logic level is being output from U4-13. A low logic level will be output from U4-13 when the PLAY or STOP button is depressed, or during Power-On-Reset, or Shut-off.
   (However, to protect the tape should the Motion Sensor Circuit become inoperative by any cause, the circuit is designed so that the F.FWD flip flop will not be reset even though the PLAY button is depressed. Refer to paragraph 9.8 for Motion Control theory)
4. U10-8 is a 2-input OR gate, and its output pin #8 will be at a low logic level when the F.FWD flip flop is in the set state or as long as the F.FWD button is being depressed.
5. U9-10 is an inverter whose output pin #10 will be a high logic level during the F.FWD mode.
6. U10-3 is a 2-input OR gate. The output will be a low logic level when in the F.FWD or RWD mode.
7. U3-3 is a 2-input NOR gate for controlling the Brake Solenoid Driver, and its output pin #3 will be at a high logic level when the F.FWD/RWD or PLAY buttons are not depressed. (see paragraph 9.10 Plunger Solenoid Driver.)
8. U5-8 is a buffer and its output pin #8 will be at a low logic level when in the F.FWD or RWD mode.
9. Operation of the RWD mode is controlled by the RWD flip flop and operating theory of the various logic signals is approximately identical to those for the F.FWD mode Control Circuitry.
10. When the F.FWD and RWD buttons are simultaneously depressed, both F.FWD and RWD flip flops will reset each other and their outputs will both go to high logic levels. However, since input pin #10 of U10-8 and pin #4 of U10-6 will both be at low logic levels

as long as the F.FWD and RWD buttons are held depressed, their outputs will each be at a low logic level, and both circuits will be in the F.FWD and RWD modes. On the other hand, when the F.FWD and RWD buttons are released at the same time, the flip flop whose button is released last will be set and the transport will remain in that mode.


(PLAY)
+5V
R2
C2
A-1
a
b
c
d
e
f
g
h
i
j
k
l
m
n
p
q
r
s
From Pin # 10 of U4-10
From Pin # 4 of U4-4
+5V
R5
C5
A-2
+5V
R6
C6
A-3
+5V
R12
C9
TAPE RUN
SIGNAL IN
B-5
R13
C10
R14
C11
2 µsec Pulse Generator
PLAY or STOP FLIP FLOP
C19
R22
C20
R23
PLAY FLIP FLOP
2 µsec Pulse Generator
R29
C25
F.FWD FLIP FLOP
RWD FLIP FLOP
+5V
R15
C12
D2
U6
Retriggerable monostable
multi-vibrator

Tape Motion Control Signals



9.8 Tape Motion Control

Motion Control in the Model 80-8 is comprised of the Motion Sensor (for detecting Reel Rotation) installed on the end of the Supply Reel Motor Shaft, the Retriggerable Monostable Multivibrators U6-8 and -6, PLAY or STOP flip flops and gate circuits. It operates so that when the PLAY button is depressed during the fast wind modes (F.FWD or RWD), the tape is slowed down and several hundred milli-seconds after the tape is completely stopped, automatically put in the PLAY mode. A protection circuit is also provided, to account for a breakdown in the Motion Sensor Circuit such as burn-out of the lamp in the Reel Motor Rotation Detector, so that the deck will not go directly into the PLAY mode from the fast wind modes when the PLAY button is depressed, or that the tape must be brought to a stop before the PLAY button can be depressed, much the same way as with conventional tape decks.

1. A ring magnet is installed on the Supply Reel Motor shaft and the rotation of this magnet causes a reed switch to switch ON and OFF. The TAPE RUN signal thus generated is input at B-5.
2. The TAPE RUN signal is a square wave of +5V and OV, and is fed to input pin #5 of U17-6.
3. U17-6 is a Schmitt trigger inverter, and a properly squared wave of opposite polarity to that of input pin #5, is output from pin #6.
4. The output of U17-6 is fed to the following Pulse Generating Circuit which consists of U16-8, U16-3, U16-6 and the RC Time Constant Circuits. The pulses from output pin #6 of U17-6, having a 2 micro-second width from rising edge to falling edge, are fed to U16-3 and U16-6 (Refer to paragraph 9.2 Pulse Generating Circuit).
5. U6-8, -6 is a Retriggerable Monostable Multivibrator, and when a low logic level pulse is fed to pins #1 and #2, a high logic level (Q) will be output from pin #8, and a low logic level ($\overline{Q}$) from pin #6, the duration (T sec.) of both output being determined by the time constant elements R15 and C12. When another pair of low logic pulse is applied to the #1 and #2 input pins before the end of the Q and $\overline{Q}$ duration, it will be extended an additional T seconds. Therefore, a chain of low logic pulses whose repetition rate is shorter than the T second duration, is applied to input pins #1 and #2, outputs Q and $\overline{Q}$ will remain constant at the same logic state. Accordingly, if the tape is moving and the reel motor rotating, pin #8 (Q) will remain at high logic level and pin #6 ($\overline{Q}$) will remain at low logic level to indicate that the tape is moving.

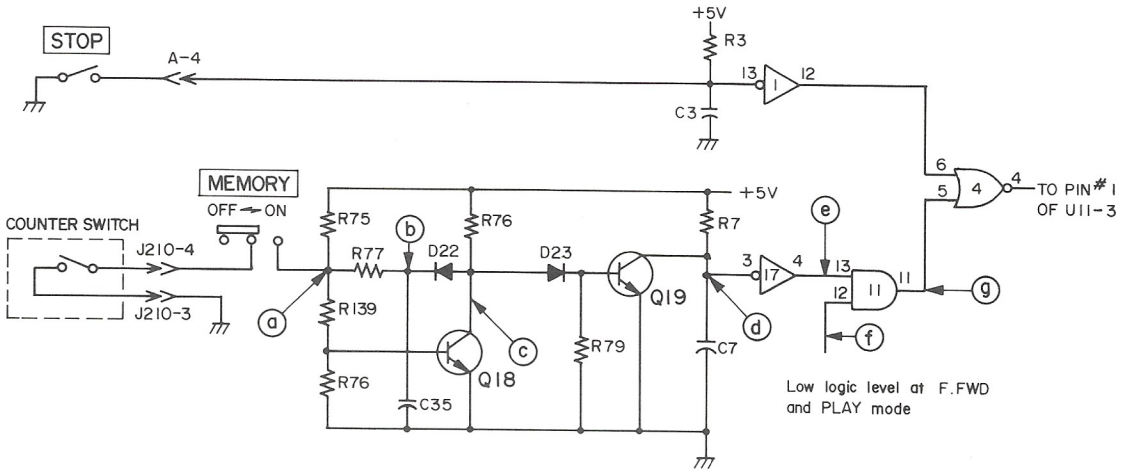
   The high logic level signal (Q) is used to gate the reset signal for the F.FWD and RWD flip flops when the PLAY button is depressed during either of these modes. This high logic level (Q) which changes to a low logic level several hundred milli-seconds after the tape stops, is used to put the deck in the PLAY mode. Also, the low logic level ($\overline{Q}$) is used to prevent the deck from going directly to the PLAY mode from either Fast Wind Modes by applying it to input pin #4 of U3-6 which is the set input circuit for the PLAY flip flop. Thus, as long as input pin #4 is kept at low logic level, the

PLAY flip flop will not be set even though the PLAY button may be depressed.

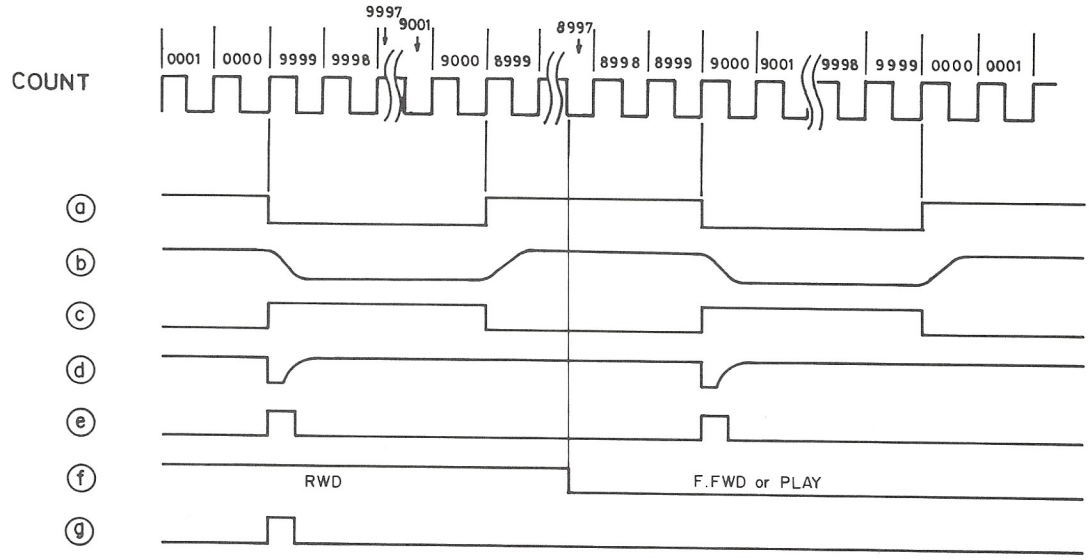
6. The PLAY or STOP flip flop made up of U12-11 and U12-8, memorizes whether the PLAY or the STOP button on the tape transport was depressed or not and thus decide whether the deck must go to the PLAY mode or the STOP mode from the Fast Winding mode. Assume that the PLAY button is depressed. The set input pin #13 of U12-11 will then go to a low logic level, thus setting the flip flop, and output pin #8 will go to a low logic level. Also, suppose that the STOP button is depressed. Reset input pin #9 of U12-8 will then go to a low logic level, thus resetting this flip flop, and output pin #8 will go to a high logic level.
7. U8-2 is an inverter and when the PLAY button is depressed, output pin #2 will go to a low logic level to set the PLAY or STOP flip flop.
8. U5-6 is a 2-input AND gate, and since input pin #5 will be at a high logic level during the Fast Winding mode due to the Q output of U6-8, output pin #6 of U5-6 will go to the high logic level when the PLAY button is depressed.
9. U4-13 is a 2-input NOR gate, and when either the PLAY or STOP button is depressed or the deck goes to the shut-off state, all during the Fast Winding mode of the tape, output pin #13 will go to a low logic level and both F.FWD and RWD flip flops will be reset.
10. The Pulse Generating Circuit consists of U8-6, U8-10 and U13-12. U8-6 is the inverter, and when the PLAY or STOP flip flop is put in the set state, output pin #6 will go to the high logic level and thus input pin #2 of U13-12 will be at high logic level. Under this condition, should the PLAY button be depressed during the Fast Wind mode, the tape will slow down and finally come to a complete stop resulting in output pin #8 of U6-8 going to low from the high logic state, and an approximately 2 micro-second low level pulse will be output from U13-12 to set the PLAY flip flop.

9.9 Counter Stop Mode

Counter Stop



Counter Stop Waveforms



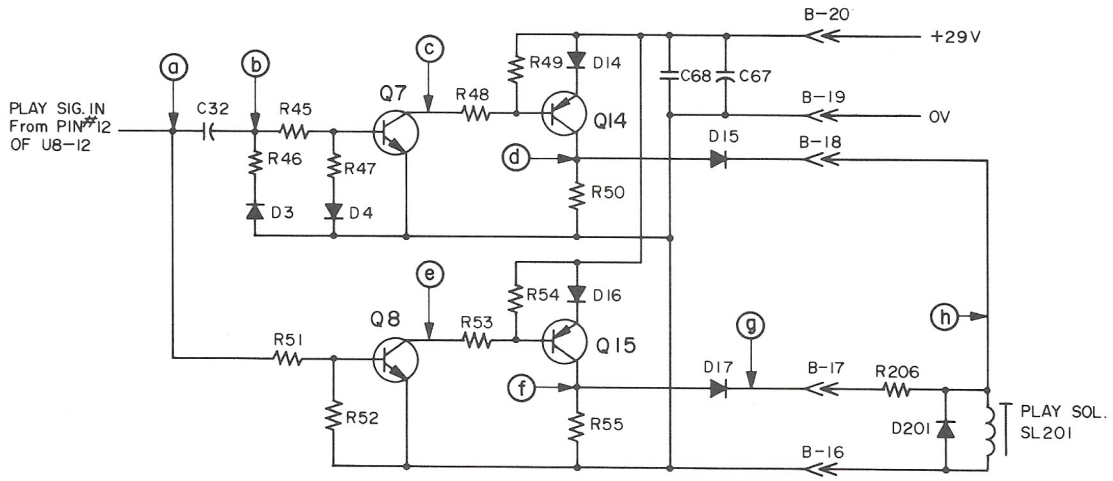
9.9 Counter Stop Mode

The Tape Counter is a 4-digit mechanical type with an integral switch that remains closed as long as the most significant digit is at "9." For instance, when the deck is in the RWD mode the counter will be down-counting in step with travel of the tape and the switch will be open up to "0000" but at the next count of "9999" the switch contact will close and remain so up to "9000" but at the next count of "8999" the contact will open again. Due to this type of switch function and that a pulse is required only at the transition from open-circuit to closed-circuit state of the switch, and also that the tape STOP-by-the-COUNTER feature is required only at the RWD mode, the circuit in concern functions as follows:

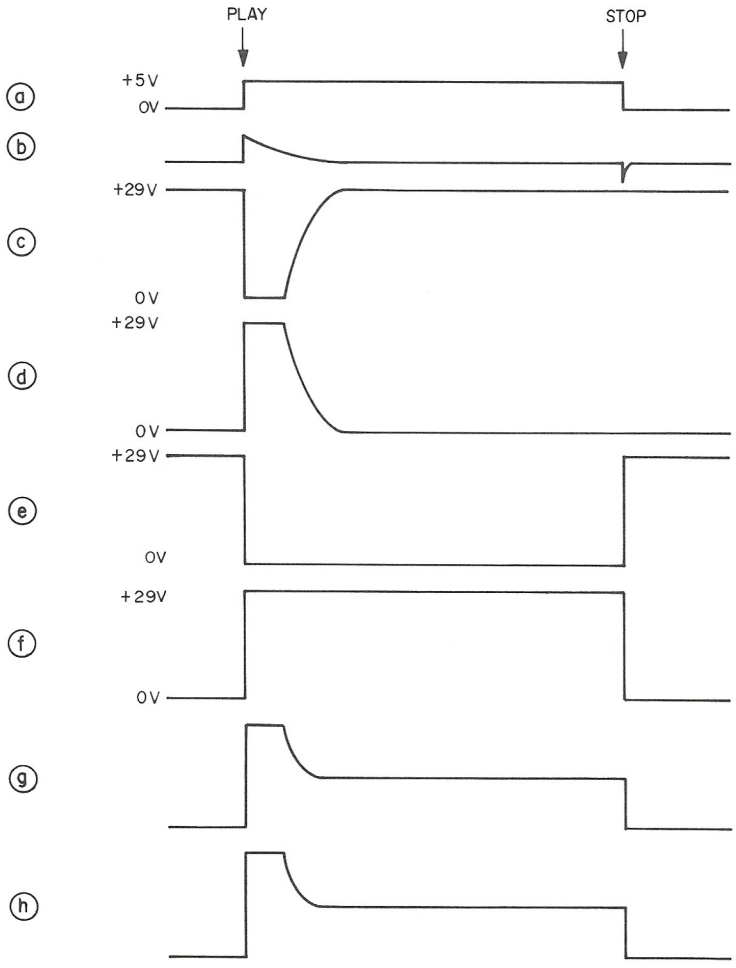
1. Lets assume the memory switch is ON. As the counter runs and the most significant digit reaches "9," the potential at 'a' will change from +5V to 0V.
2. Wnen point 'a' changes to 0 volt, Q18 will change from the ON state to the OFF state and the potential at 'c' will then be about +5V.
3. However, the point 'b' potential of about +5V will gradually fall to 0V by effect of time constants C35 and R77.
4. As a result of this different rate of potential change between points 'b' and 'c', Q19 will switch ON for several milli-seconds.
5. U17-4 is an inverter for converting the Q19 low logic level output to a high logic level.
6. U11-11 is a 2-input AND gate, and when there is a high logic level at pin #12, a high logic level pulse of several milli-second will be output from pin #11 (the conditions for pin #12 of U11-11 to be at high logic level are when the deck is in other than the F.FWD and PLAY modes). Therefore, when the counter changes from "8999" to "9000," or in other words, when in the F.FWD or PLAY modes, there will be a high logic level up to point 'e' but since pin #12 of U11-11 will be at low logic level, there will be no high logic level pulse from the output pin #11.
7. As pin #11 of U11-11 is connected to pin #5 of U4-4, it will cancel the RWD mode by the same condition as by the STOP button.
8. Also, when the potential of point 'a' rises from 0V to +5V, or in other words, when the count changes from "9999" to "0000," there will be no pulse from Q19. This is because at the instant the count changes from "9999" to "0000" Q18 will go to the ON state, the potential at point 'c' will immediately drop to about 0V and thus turn OFF Q19 regardless to the slow change in potential of point 'b.'

9.10 Solenoid Driver Circuit

Solenoid Driver



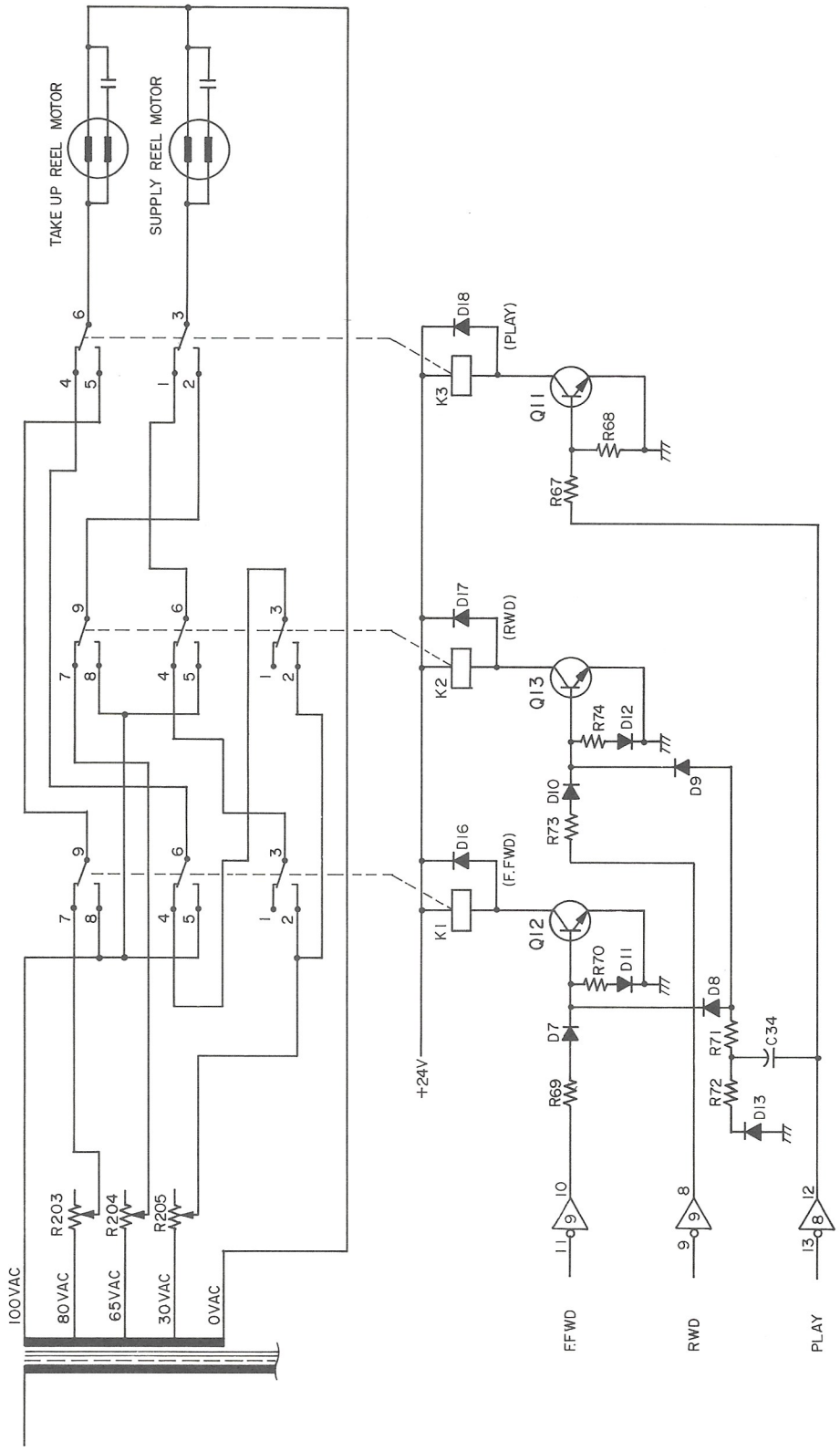
Solenoid Driver Waveforms



9.10 Solenoid Driver Circuit

1. The Plunger Solenoid Drivers are comprised of the Q7 and Q14 Short Term Drive Circuit and the Q8 and Q15 Continuous Drive Circuit.
2. In the Short Term Circuit, when the low logic level signal appearing at point 'a' changes to a high logic level, it is passed through the differential circuit of C32, R45, and R47, applied to Q7 to switch it ON for a short duration of several hundred milli-seconds.
3. When Q7 momentarily goes to the ON state, a base current from Q14 will flow through R48 to momentarily switch ON Q14, also for several hundred milli-seconds.
4. When Q14 switches ON its collector potential 'd' will rise to about 29V for a duration of several hundred milli-second, and a current 'h' will flow via D15 through the plunger solenoid SL201.
5. In the Continuous Drive Circuit, Q8 will be in the ON state as long as the signal applied to point 'a' is at high logic level.
6. With Q8 in the ON state, a base current will flow from Q15 via R53, and Q15 will be in the ON state.
7. When Q15 switches ON its collector potential 'f' will rise to about 29V, and a current will flow to the plunger solenoid SL201 via D17 and R206. However, there will be a voltage drop due to R206 and thus the plunger solenoid terminal voltage'h' will be equal to 29V minus this voltage drop. Therefore, as the +29V supplied to the plunger solenoid from the Short Term Drive Circuit gradually drops, the current will continue to flow with equal potentials at points 'g' and 'h' until the high logic signal at point 'a' goes to low logic level at which the current will cease to flow.

9.11 Reel Motor Control



9.11 Reel Motor Control

The reel motors are controlled by switching combinations of the relay circuits. To provide a stable travel of the tape, especially in the PLAY mode, the reel motors are controlled in such a way that a voltage higher than at the constant state in the PLAY mode, is momentarily applied to the reel motors are the instant the PLAY button is depressed. In this case, the three relays K1 (F.FWD), K2 (RWD), and K3 (PLAY) are all momentarily energized in such a way as to create a large torque, then K1 and K2 canceled after a predetermined time, after which normal torque in the PLAY mode is provided by K3.

1. Q11 ∿ 13 are the Relay Drive Transistors, each of which will be switched ON when a base current flows to allow a current from the +24V supply to flow to each relay, thus energizing them.
2. Q12 and Q13 are the Drive Transistors for K1 and K2, respectively. K1 and K2 are the F.FWD and RWD relays but when the deck is put in the PLAY mode, these are momentarily switched ON by the time constant circuit composed of C34, R71, R70 and R74.

9.11.1 Motor Control in the PLAY Mode

1. U8-12 is an inverter and its output pin #12 will go to high logic level when the deck is put in the PLAY mode.
2. When output pin #12 of U8-12 goes to the high logic level, a base current will flow via R67 through transistor Q11, thus switching it ON to energize relay K3. At the same time, base currents will momentarily flow via C34 and R71 through transistors Q12 and Q13, thus momentarily switching them ON to energize relays K1 and K2.
3. During the initial period of the PLAY mode, since all relays K1, K2, and K3 are energized at the same time, a 100V A.C. current, which is higher than in the normal PLAY mode, will be applied to both reel motors from the transformer, one route being to the take-up reel motor via K1-8, K1-9, K3-5, K3-6; the other route to the supply reel motor via K2-8, K2-9, K3-2, and K3-3.
4. When K1 and K2 are de-energized after a predetermined length of time, the PLAY mode normal state voltage from the transformer 80V tap is applied to the take-up reel motor via R203, K1-7, K1-9, K3-5, K3-6; and 65V from the transformer tap to the supply reel motor via R204, K2-7, K2-9, K3-2 and K3-3.

9.11.2 Motor Control in the F.FWD Mode

1. U9-10 is an inverter and its output pin #10 will go to high logic level when the deck is put in the F.FWD mode, a base current will flow via R69 and D7, thus switching ON transistor Q12.
2. With switch ON of transistor Q12, relay K1 will be energized to apply voltages for the F.FWD mode to both reel motors.

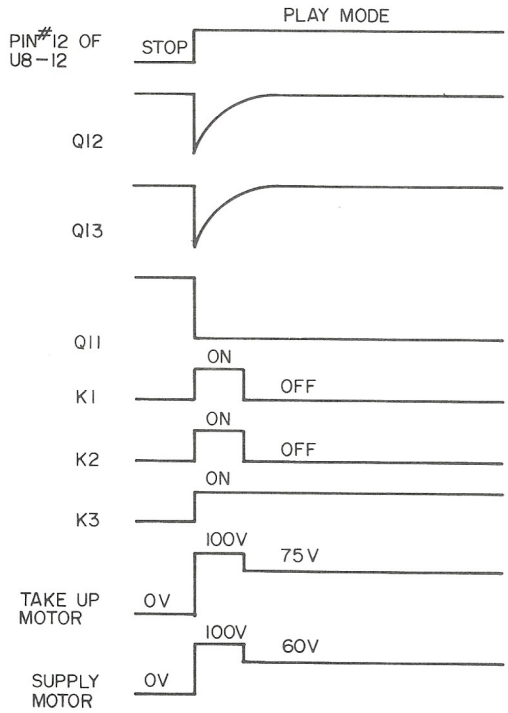
3. Thus, 100V A.C. will be applied to the take-up reel motor via K1-5, K1-6, K3-4 and K3-6; and 30V A.C. from the transformer tap to the supply reel motor via R205, K1-2, K1-3, K2-4 and K2-6.

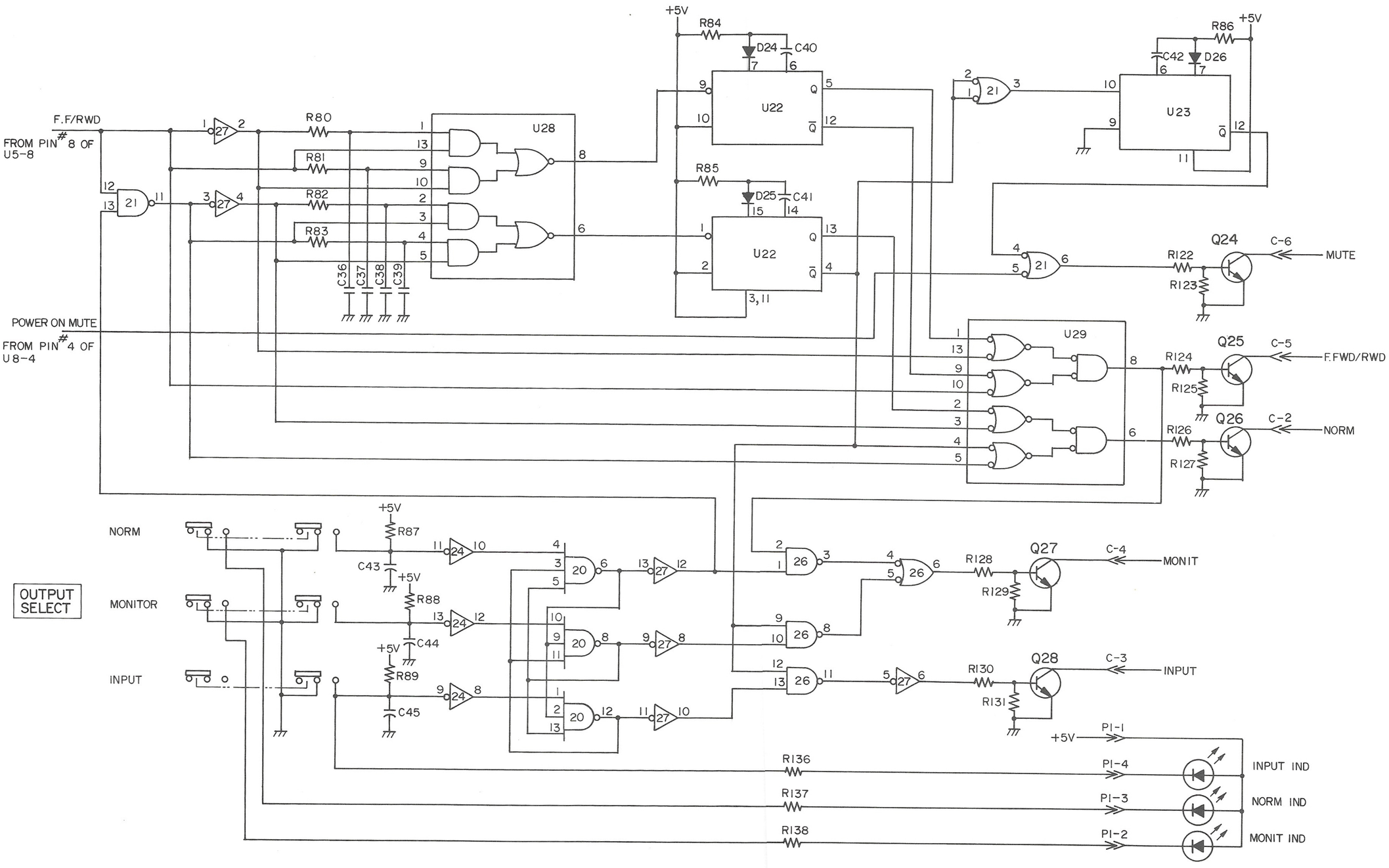
9.11.3 Motor Control in the RWD Mode

1. U9-8 is an inverter and when the deck is put in the RWD mode, output pin #8 will go to the high logic level, a base current will flow via R73 and D10, and transistor Q13 will switch ON.
2. With switch ON of Q13, relay K2 will be energized to apply voltages for the RWD mode to both reel motors.
3. Thus, 100V A.C. will be applied to the Supply Reel Motor via K2-5, K2-6, K3-1 and K3-3; and 30V from the transformer tap to the Take-up Reel Motor via R205, K2-2, K2-3, K1-4, K1-6, K3-4 and K3-6.

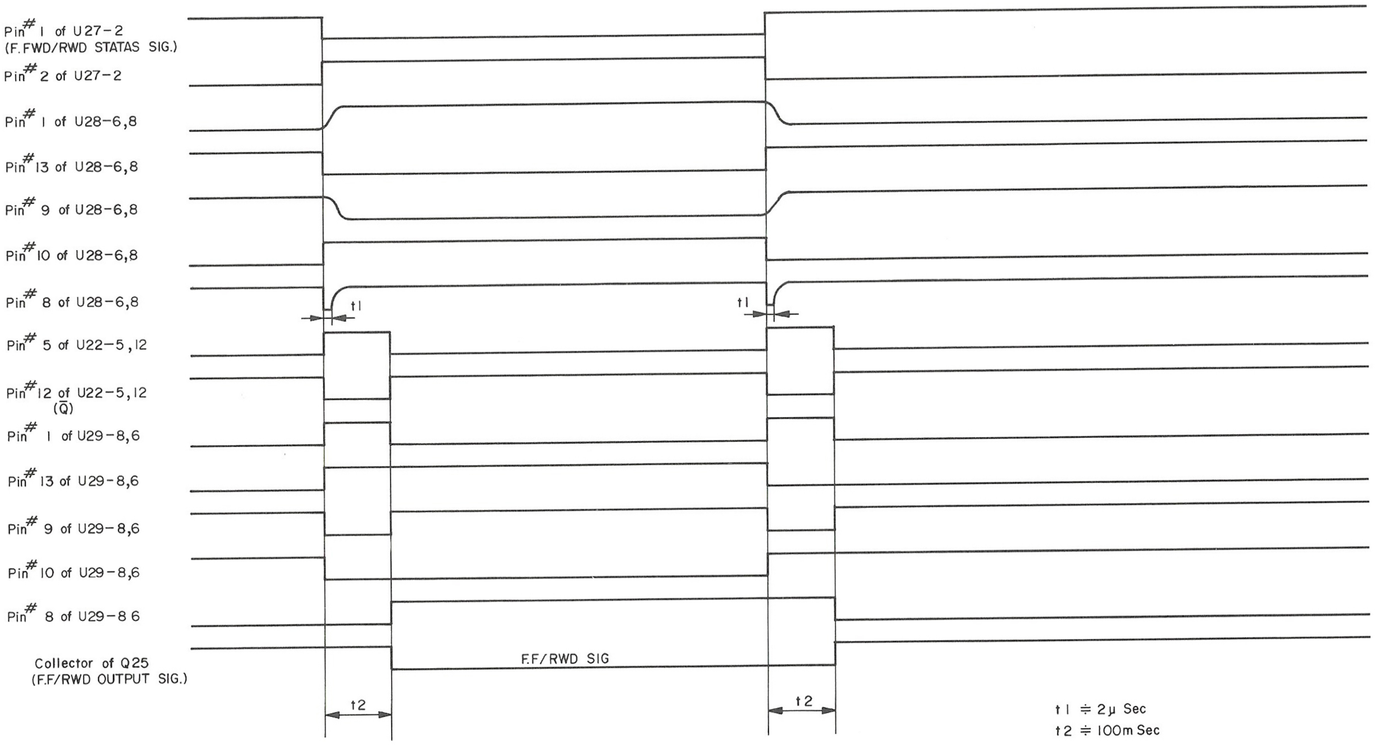
9.11.4 F.FWD + RWD Mode

1. Since both K1 and K2 will be energized in the F.FWD and RWD mode, 100V A.C. is applied to both reel motors at the same time.
2. Thus, the same 100V A.C. is applied to the Supply Reel Motor via K2-5, K2-6, K3-1 and K3-3; and to the Take-up Reel Motor via K1-5, K1-6, K3-4 and K3-6.

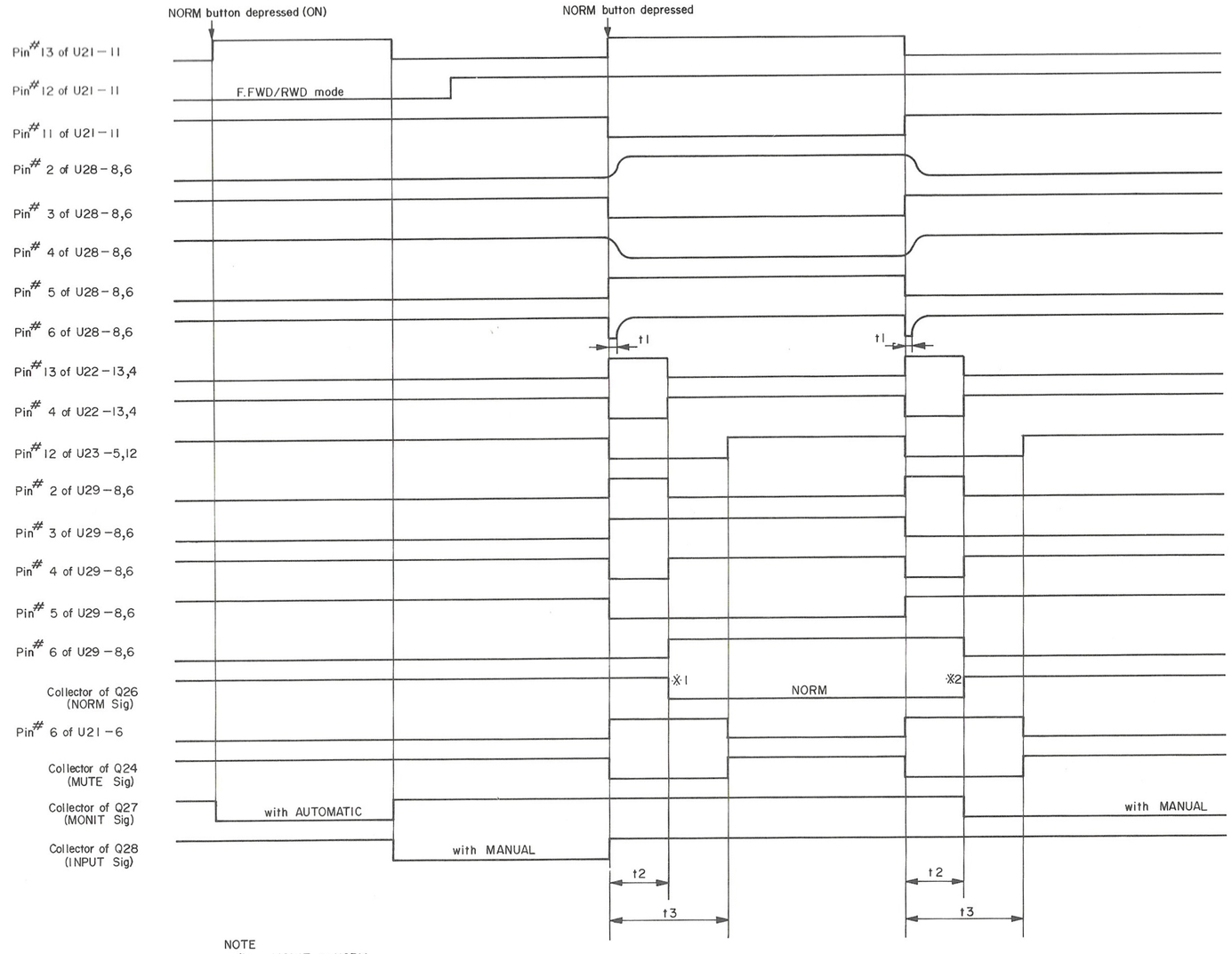



F.F/RWD
FROM PIN # 8 OF U5-8
POWER ON MUTE
FROM PIN # 4 OF U8-4
OUTPUT SELECT
NORM
MONITOR
INPUT
+5V
R80
R81
R82
R83
R84
R85
R86
R87
R88
R89
C36
C37
C38
C39
C40
C41
C42
C43
C44
C45
D24
D25
D26
U22
U23
U28
U29
Q24
Q25
Q26
Q27
Q28
R122
R123
R124
R125
R126
R127
R128
R129
R130
R131
R136
R137
R138
MUTE
F.FWD/RWD
NORM
MONIT
INPUT
INPUT IND
NORM IND
MONIT IND
C-6
C-5
C-2
C-4
C-3
P1-1
P1-4
P1-3
P1-2

(by F.FWD and RWD buttons)



(by OUTPUT SELECT buttons)



NOTE
※1 MONIT → NORM
※2 NORM → MONIT
t1 ≒ 2μ Sec
t2 ≒ 100m Sec
t3 ≒ 300m Sec

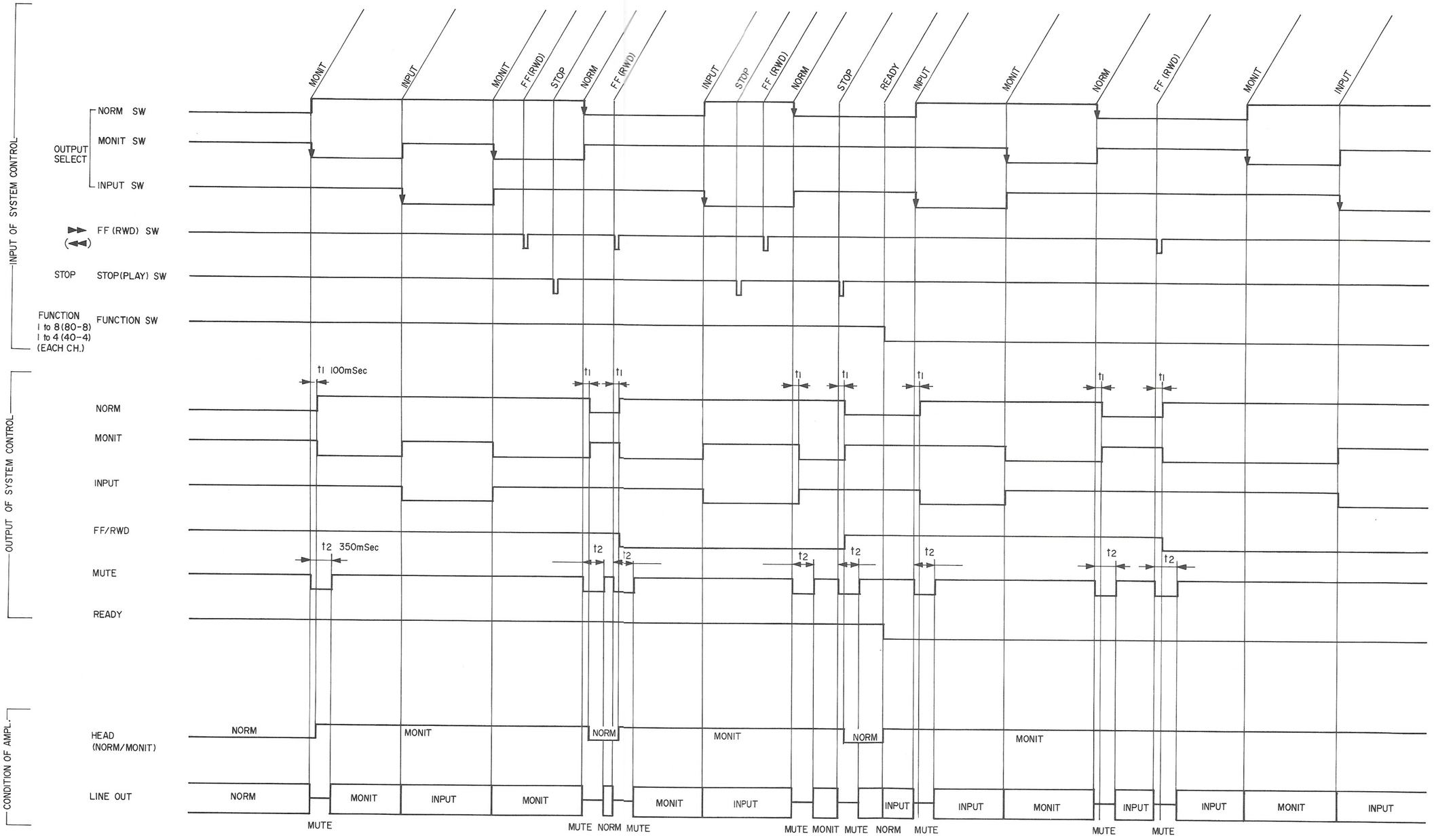
9.12 Output Select/Function Select

A control signal for selecting the audio output is sent to the record/reproduce amplifier from the System Control Unit by depressing any one of the three OUTPUT SELECT buttons - namely, MONIT, NORM or INPUT. A feature of the control signal is that when the tape transport is put in either the F.FWD or RWD mode, if the NORM button has been depressed, the output will automatically be switched to MONITOR, or if the MONIT button has been depressed, it will be switched to NORM.

1. Each of the three OUTPUT SELECT buttons - MONIT, NORM and INPUT - are 2 circuit switches. When the button is depressed, each circuit is shorted to the OV line and that circuit will go to low logic level. Also, as the other set of contact is connected to the cathode of the Indicator LED's, depressing the switch will bring the cathode of the LED to OV, a current will flow and the LED lighted. However, one circuit of the two for the INPUT button, is used to switch the control signal for either the encode or decode mode of the dbx Unit, and when the INPUT button is depressed the dbx Unit is made to go to the ENCODE mode.
2. U24-10, U24-12 and U24-8 are the inverter IC's for inverting into high logic levels, the low logic levels produced when each of the OUTPUT SELECT button is depressed.
3. U20-6, U20-8 and U20-12 are 3-input NAND gates which working together prevent any of the output from going to low logic level when two or more OUTPUT SELECT buttons are depressed. Only when any one of the OUTPUT SELECT buttons is depressed will there be a low logic level from one output among the three U20's.
4. U27-12, U27-8 and U27-10 are inverter IC's and any one of the U20 output selected by the OUTPUT SELECT buttons is inverted and output as a high logic level.
5. U26-3 is a 2-input NAND gate, and when the deck is in the F.FWD or RWD mode and the NORM button is depressed, it will switch the Amplifier Control Signal from NORM to MONIT, and also the head from Normal to Monitor. The timing and sequence of this control signal is shown in the Timing Chart, page 131.
6. U26-6 is a 2-input NOR gate which will put out a high logic level from pin #6 when the OUTPUT SELECT MONIT button is depressed or, when the tape transport is in either the F.FWD or RWD mode with the OUTPUT SELECT NORM button depressed.
7. U26-8 and U26-11 are 2-input NAND gates to which an approximately 100 milli-second low logic level signal will be applied to input pins #9 and #12 when the OUTPUT SELECT NORM button is either depressed or canceled. Due to this circuit function, in accordance to whether U26-8 or U26-11 is selected, the low logic level indicating the selected mode will be output from pin #8 or #11 with a certain length of delay from the instant the OUTPUT SELECT button is depressed.
8. Transistors Q24 through Q28 are for interfacing between the Record/Reproduce Amplifier. Each transistor output is connected to their respective circuits in the record/reproduce amplifier which are controlled by the low logic level signals from the transistors.

9. U21-6 is a 2-input NOR gate and its output pin #6 will go to high logic level when any one of the OUTPUT SELECT button is depressed thus sending a mute signal from U23 to pin #4 of U21-6 or, when a POWER ON MUTE signal is sent to pin #5 of U21-6. This high logic level MUTE signal from pin #6 will then go through Q24 to the record/reproduce amplifier to mute its line output.
10. On the output signals from Q24, Q25 and Q26, please refer to the Timing Chart. Each control signal for NORM, F.FWD and MUTE are transmitted to the record/reproduce amplifier in these timing relations.

Audio Switching Control Signals



9.13 REC/REPRO Amplifier

[Refer to the circuit schematic for the Record/Reproduce Amplifier on page 95 at reading this item on the record/reproduce amplifier control functions.]

The Record/Reproduce Amplifier of the Model 80-8 consists of the Signal Select Circuit, Reproduce Amplifier, Record Amplifier, Meter Amplifier and the PEAK Indicator Amplifier. All Record/Reproduce Amplifiers are controlled entirely by the System Control Unit in the tape transport. The Control Signals from the transport are routed to the Signal Select Circuits in each rec/repro amplifier to put them in the modes commanded by the control signals. Since each reproduce amplifier is used in common with the NORMAL and MONITOR heads, the Signal Select Circuit will automatically select the proper head in accordance to the setting of the OUTPUT SELECT and FUNCTION SELECT buttons, and the operating mode of the tape transport.

9.13.1 Signal Select Circuit

This circuit is for controlling the operating mode of the record/reproduce amplifiers.

A) MONITOR mode

1. U5-3 is a 2-input NOR gate and when the OUTPUT SELECT MONIT button is depressed or when a F.FWD signal is received from the System Control Unit, either one or both pins #2 and #1 will go to low logic level and thus output pin #3 will go to high logic level.
2. U6-3 is an open collector type 2-input NAND gate and when the OUTPUT SELECT INPUT button is <u>not</u> depressed and the output pin of U5-3 is a high logic level, then output pin #3 of U6-3 will go to low logic level.
3. This low logic level will set the FET switch Q1 to the ON state to allow the MONIT head reproduce signal to be output from the rec/repro amplifier line output.

B) NORM mode

1. U4-6 is an inverter and when the OUTPUT SELECT NORM button is depressed, and a NORM signal from the System Control Unit is applied to input pin #5, then output pin #6 will go to high logic level.
2. U5-6 is a 2-input NAND gate, and when the output of U4-6 is at high logic level, and none of the FUNCTION SELECT button is depressed (in the SAFE mode), then output pin #6 of U5-6 will be at low logic level.
3. U4-4 is an inverter for converting the low logic level output of U5-6 to a high logic level.
4. U6-6 is an open collector type 2-input NAND gate, and when its input pin #4 is at high logic level with no F.FWD/RWD signal from the System Control Unit, then, output pin #6 will go to low logic level.
5. This low logic level will then set the FET switch Q2 to the ON state, and at the same time, by action of inverter U4-2, transistor Q17 will be switched ON to drive K1, thus allowing the NORM head reproduce signal to be output from the rec/repro amplifier line output.

C) INPUT mode

1. U5-11 is a 2-input NOR gate, and when the OUTPUT SELECT INPUT button is depressed and when input pin #12 of U5-11 is at low logic level, its output pin #11 will go to high logic level.
2. U6-8 is an open collector type inverter, and when input pins #9 and #10 are at high logic level, its output pin #8 will go to low logic level.
3. The FET switch Q3 will then go to the ON state by this low logic level and the line input signal will be output from the rec/repro amplifier Line Output.
4. U4-10 is an inverter, and when the FUNCTION SELECT button is depressed and the deck is thus in the READY state, its output pin #10 will go to high logic level.
5. U5-8 is a 2-input NAND gate, and when a FUNCTION SELECT button is depressed and furthermore, when a NORM signal from the SYSTEM CONTROL UNIT is applied to pin #5 of U4-6, output pin #8 of U5-8 will go to low logic level which is then applied to pin #12 of U5-11.

D) RECORD mode

1. U4-12 is an inverter, and when a REC D.C. low logic level from the SYSTEM CONTROL UNIT is applied to input pin #13 of U4-12, this will make its output pin #12 go to high logic level.
2. U6-11 is an open collector type 2-input NAND gate, and when a FUNCTION SELECT button is depressed and in addition, a REC D.C. is applied to input pin #13 of U4-12, then output pin #11 of U6-11 will go to low logic level.
3. The rec/repro amplifier will then go to the RECORD MODE by this low logic level signal.

9.13.2 REPRODUCE Section

1. K1-1 are the selector contacts for connecting the MONITOR or NORMAL head to the reproduce amplifier, and the K1 select signal is output from the Signal Select Circuit.
2. Output from either the MONITOR or NORMAL head selected by K1-1 is passed through the step-up transformer T1 and amplified by the Reproduce Equalizer U1-7 (IC1). Selecting of which equalization in the Reproduce Equalizer U1-7 is commanded by the Signal Select Circuit. The output from U1-7 is then set by the MONIT and NORM gain adjusting pots to about -40dB at the input pin #3 of U1-1 (IC1-1), passed through the analog switches Q1 ∿ Q4, amplified to a level of -10dB (0.3V) by U1-1, selected for LINE OUT by the Signal Select Circuit, and output as an audio signal in either the INPUT, NORM, or MONIT modes.
3. Q1 ∿ Q4 are FET analog switches which will be switched ON when the gate is at about zero volt or switched OFF when at about 13 volts.
4. Q5 is the Meter Drive Amplifier which is set so that the VU meter will indicate zero VU when the LINE OUTPUT level is -10dB (0.3V).
5. Q6, U3-11 (IC3), and U3-3 (IC3) comprises the Peak Indicator Amplifier which will make the LED located at upper right of the VU meter to light-up by a current from the +5V supply via the LED, R37 and U3-3, when the level is +10VU.

9.13.3 RECORD Section

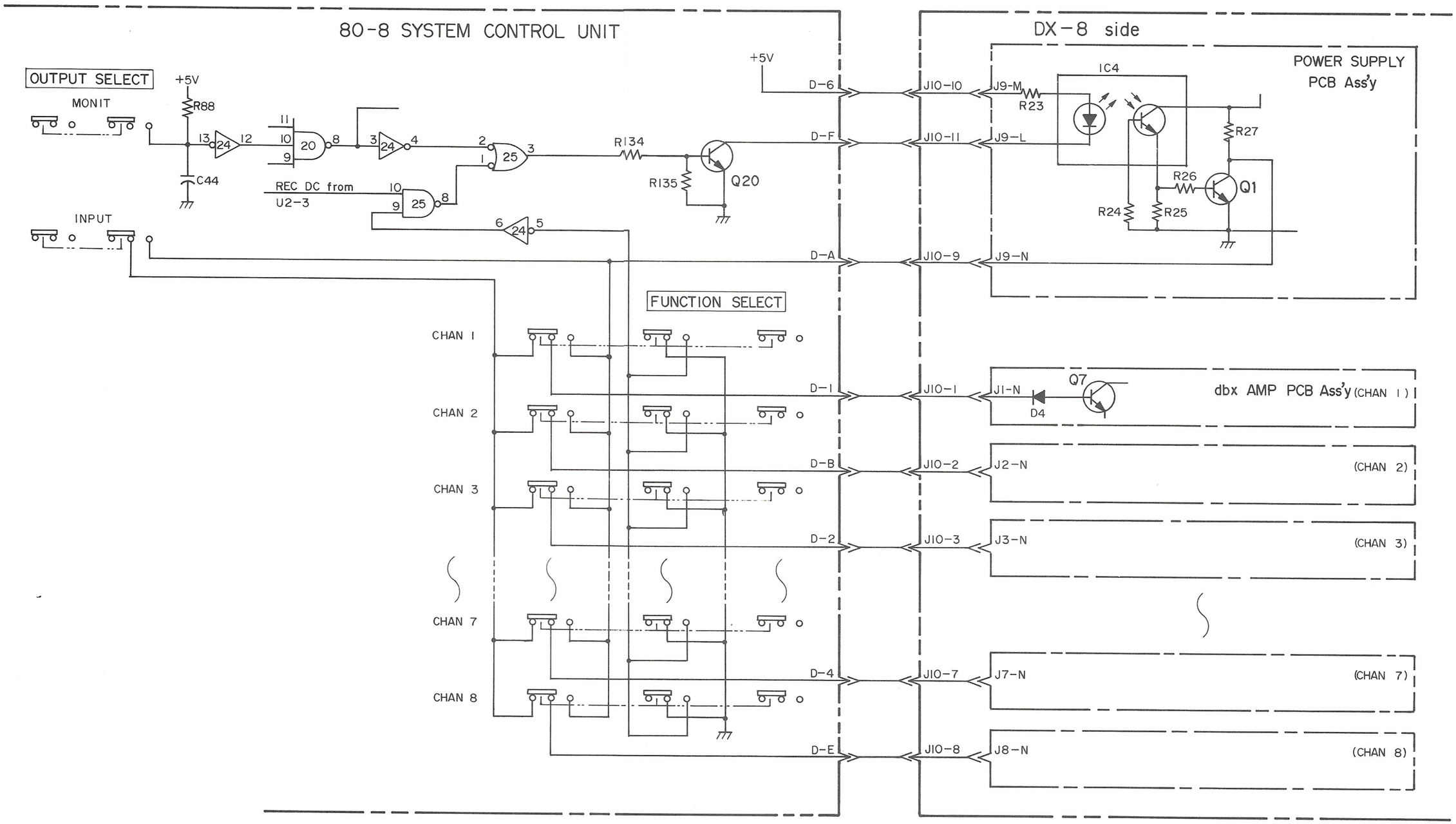
1. The LINE INPUT signal is split in two, and one is passed through the recording equalizer U2-1 (IC2-1) and then to the Constant Current Drive Circuit.
2. The other LINE INPUT signal is sent to the FET switch Q3, in the reproduce amplifier, via R107, and when INPUT is selected by the Signal Select Circuit the LINE INPUT signal is output from LINE OUTPUT for monitoring the input signal.
3. The Constant Current Drive Circuit is a high output impedance circuit consisting of Q8, Q9 and Q10 for driving the recording head with a constant current audio signal. The audio signal coming into LINE INPUT is equalized by the previous stage recording equalizer, passed through this constant current drive circuit, the bias current added and then applied to the head.
4. K2-1 are the contacts for connecting the NORMAL head to either the recording circuit or the reproduce circuit. The NORMAL head will be connected to the recording amplifier output when Q18 is switched ON by the Signal Select Circuit but when Q12 is in the OFF state, the NORMAL head will be connected to the reproduce amplifier input.

9.13.4 BIAS Section

1. A stable 100KHz bias signal of approximately 800mV p-p is constantly supplied to the BIAS AMPLIFIER from the Master Bias Oscillator in the System Control Unit. The 100KHz bias signal passing through the emitter follower amplifier Q11 and C36 is then constantly applied to the FET switch Q12.
2. Q12 and Q13 are the FET and transistor switches for selecting whether or not to allow the 100KHz master oscillator output signal to pass onto the bias amplifier. Q12 is for serially switching ON or OFF the signal and Q13 is for shorting the circuit between the bias amplifier input and the zero volt line so that the bias signal is positively prevented from going to the bias amplifier in other than the RECORD mode.
   On the other hand, when a RECORD mode command comes from the Signal Select Circuit, Q12 will switch ON, Q13 will switch OFF, and the 100KHz master bias output signal is allowed to pass on to the bias amplifier input.
3. The Bias Amplifier consists of transistors Q14, 15, and 16. This circuit amplifies the master bias signal to apply an erase current and recording bias to the ERASE and RECORD heads. The 100KHz signal amplified by Q14 is then bandpass amplified by the tank circuit of T2 and C41 to make a base current to flow in Q15 and Q16. Q15, Q16 and T3 comprises a push-pull amplifier which amplfies by resonance of C43 and the T3 primary impedance reflected back from the head connected to its secondary winding, and finally output from the secondary of T3. Output level of the 100KHz signal is adjusted to 140 ∿ 150V p-p by R111.

4. K2-2 are contacts for switching ON and OFF the ERASE head with the bias amplifier. When the deck is put in the RECORD mode, K2 will switch ON by a signal from the Signal Select Circuit to connect the ERASE head with the bias amplifier.
5. R111 and R112 are the adjusting pots, respectively, for the bias amplifier input and the record bias.

9.14 Control of DX-8 from the Model 80-8 Transport



9.14 Control of DX-8 from the Model 80-8 Transport

Since the Model DX-8 is the Encode/Decode Switchable Type, it is automatically switched to either the encode or decode mode according to how each of the OUTPUT SELECT and FUNCTION SELECT buttons are depressed, and whether the transport is in the record mode or reproduce mode.

9.14.1 Encode mode

There are 3 conditions in which the DX-8 will go to the encode mode.

a) All channels of the DX-8 will go to the Encode Mode when the INPUT button of the OUTPUT SELECT buttons is depressed.

b) Channels selected by the FUNCTION SELECT buttons only will go to the Encode Mode when the OUTPUT SELECT NORM button is depressed.

c) Channels in the record mode only will go to the Encode Mode when the transport is in the recording mode.

9.14.2 Decode mode

The condition under which the DX-8 will go to the Decode Mode is when not any FUNCTION SELECT button and the OUTPUT SELECT INPUT button is not depressed.

As previously explained, the condition at which the DX-8 goes to the Encode Mode is when the transport is in the Input Monitor Mode whereby the program fed to LINE IN appears at LINE OUT of the Model 80-8. On the other hand, the condition at which DX-8 goes to the Decode Mode is when in the Reproduce Mode whereby the tape reproduce sound appears at LINE OUT.

1. U24-4 is an inverter to convert the U20-8 high logic level output into low logic level and applied to pin #2 of U25-3.
2. U25-3 is a 2-input NOR gate and its output pin #3 will go to high logic level when the OUTPUT SELECT MONITOR button is depressed or when the transport is put into the RECORD mode.
3. Q20 is the transistor for interfacing between the DX-8, and will be switched ON by the high logic level output from U25-3 thus allowing a current to flow from the +5V supply through the LED inside the photocoupler IC4 via R23.
4. When a current thus flows through the photocoupler LED in the DX-8 side, transistor Q1 will switch ON to bring down to about zero volt the "make" contacts of the FUNCTION SELECT switches and the OUTPUT SELECT INPUT switch.
5. Under the condition of above Item 4, if any one of the FUNCTION SELECT button is depressed, the Encode/Decode Selector Terminal of the dbx Amplifier PCB Assembly will drop to about zero volt and that particular channel will go to the Encode Mode.
6. Also, under the condition of above Item 4, when the OUTPUT SELECT INPUT button is depressed, the Encode/Decode Selector Terminals for all channels of the dbx Amplifier PCB assemblies will drop to about zero volt and all channels will go to the Encode Mode.

10. NORMAL AND MONITOR HEAD ALIGNMENT AND TAPE GUIDE ADJUSTMENT

These heads do not require TILT, TANGENCY and HEIGHT adjustments after installation since they are precisely machined in these dimensions. However, AZIMUTH (phase shift) only can be trimmed by two screws on the rear of the head.

I) Head Installation Procedure

1. Loosen the two azimuth adjusting screws on rear side of the head so that the tips are clear of the Head Base Plate.
2. Install head onto the Head Base Plate with the two mounting screws from the underside of the Base Plate and tighten the screws.
3. Connect test equipments to the deck as shown in Fig. 1 for azimuth adjustments.
4. Set Output Select button to NORMAL for the Normal head azimuth adjustment.
5. Thread the YTT-1144 Test Tape on the deck, then play the 10KHz (0dB) test tone.
6. Slowly rotate either one of the azimuth screw on the Normal head until maximum reading on the AC voltmeter, and minimum phase shift (90° or less) on the oscilloscope, are obtained (see Figs. 2 and 3).

   If the specified phase shift cannot be obtained, withdraw this screw and adjust the screw on the opposite side until the proper phase shift is obtained.

   After the proper phase shift is obtained, tighten the other screw while observing the phase shift on the oscilloscope. You will note that the phase will go off adjustment but this can be corrected by tightening the other screw. Alternately tighten both screws while maintaining the proper phase shift but be careful not to apply too much pressure.

** Be sure the azimuth screw tip on one side is clear of the Base Plate while the other is being adjusted.

** After the Normal head is adjusted for azimuth in the reproduce mode, no further adjustment in the record mode is required.

7. Set the Output Select button to MONITOR for the Monitor head azimuth adjustment, then follow the same procedure above.

II) Tape Guide Height Adjustment

Although the height of tape guides is the key to a correct tape path, it is not necessary to readjust them upon replacement of a head as they are precisely adjusted on the production line before shipment. However, should height adjustment become necessary on replacing of a worn or damaged tape guide, use of the proper Height Gauge is required (see Fig. 4).

In case such a need arise, please contact the Service Department of TEAC Corporation of America or TEAC Corporation, Tokyo.

* Connecting diagram for head azimuth adjustment.

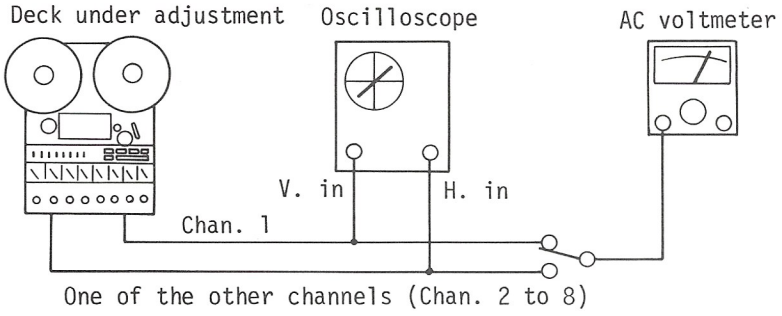


Fig. 1

* Phase shift patterns on the oscilloscope

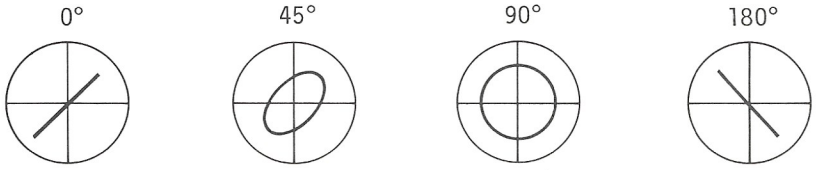


Fig. 2

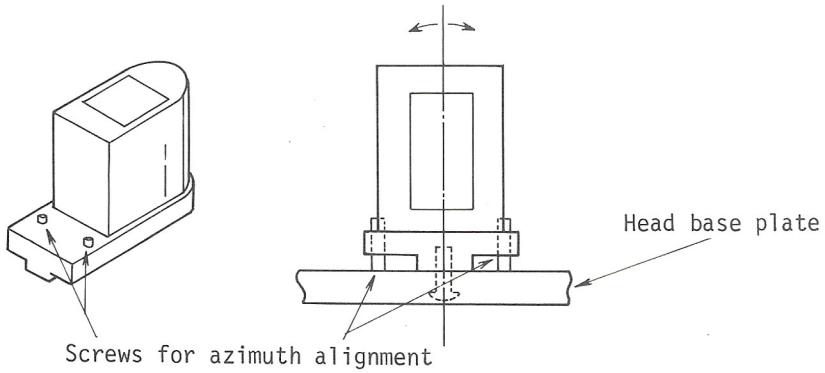


Fig. 3

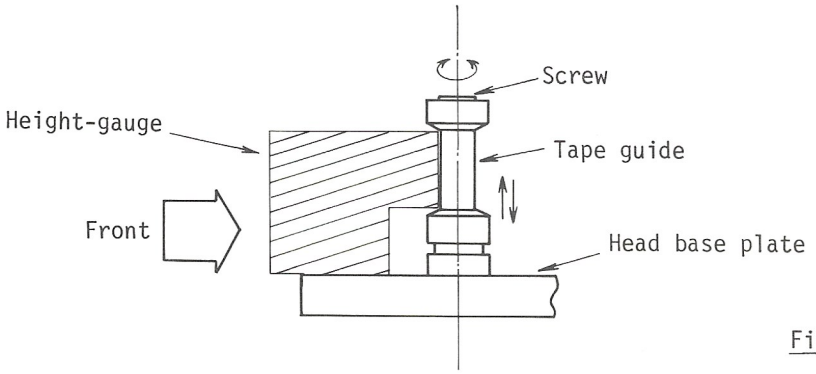
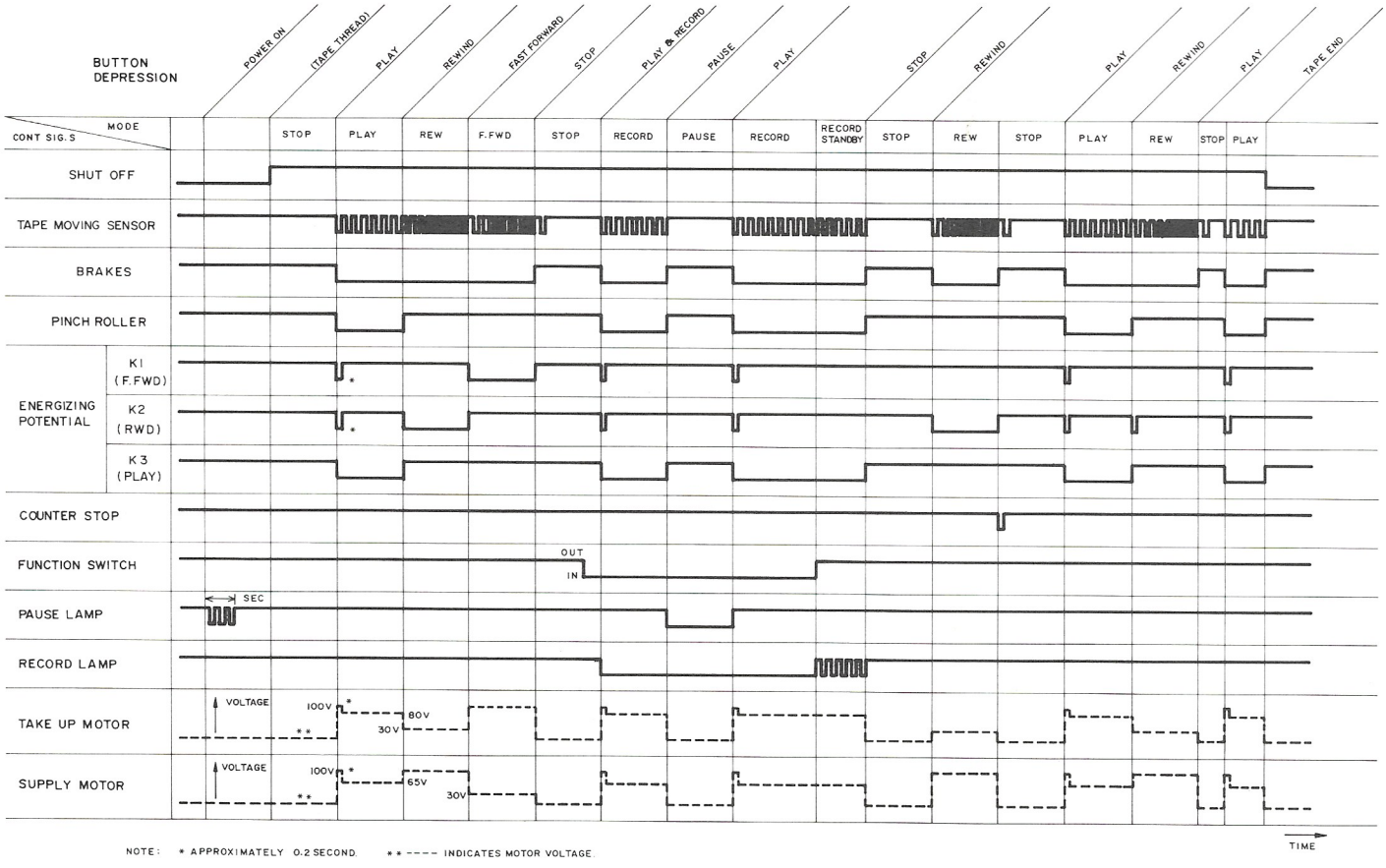


Fig. 4

11. SYSTEM CONTROL AND SWITCHING SIGNAL TIME CHART

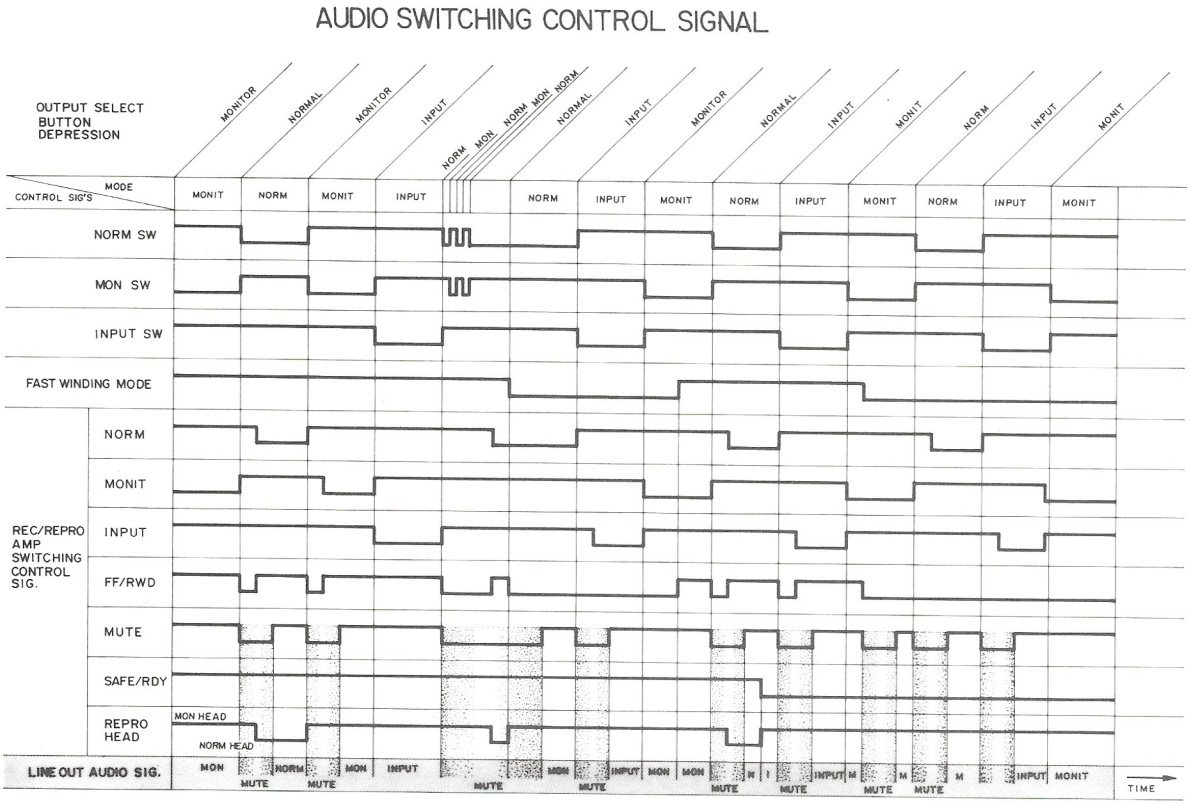
11.1 Tape Logic Control Signals

TAPE LOGIC CONTROL SIGNAL



NOTE: * APPROXIMATELY 0.2 SECOND. ** ---- INDICATES MOTOR VOLTAGE.

11.2 Audio Switching Control Signals



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